The decentred ego in a non-local world: From power to will

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Thesis presented in fulfillment of the requirements for the degree of Master of Science (Psychology) at the University of Stellenbosch.

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April 2005

Statement

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or part submitted it at any university for a degree.

…… ……

Signature Date

Abstract

The study identifies a basic psycho-logico assumption, coined the premise of locality, which is postulated by the author to permeate most of historical and contemporary psychological, philosophical and scientific thought. In light of the latter supposition the study explores the domain of quantum physics, whence an alternate psycho-logico assumption, the premise of non-locality, is conceptualised. The semantic implications of the non-locality premise are elucidated by investigating the meaning, character and symptoms of the locality premise. The indicative factors of the premise of locality are enumerated and consequently articulated upon the psychological thought of Jacques Lacan. The study demonstrates how the implicit locality assumptions in Lacan's thinking are the provenance of the incompatibility of his mirror-stage formulation and the empirical findings of contemporary mirror self-recognition research. Assuming a premise of non-locality the author develops a psychological perception structure, coined dichotomous subject objectification. Dichotomous subject objectification represents the localized experience of the self as subject characterized by the capability for mirror self-recognition. Intuited by the premise of non-locality, the author introduces the notion of 'non-local perceptum'. The physiological dynamics of non-local perceptum is conceptualised by explicating the meaning of 'absolute power states'. The disposition of absolute power states in terms of dichotomous subject objectification is functionalised by correlating the latter with Michel Foucault's conceptualisation of power-relations. Concerning the latter, particular attention is given to Foucault's understanding of the modern day disparity between disciplinary power and sovereign power; the possible influence of this disparity on the psychological experience of the localized subject is subsequently investigated and a certain 'cognitive dissonance' is revealed. Localized psychological experience emanating through non-local perceptum is further illuminated by explicating the logical relevance of Socrates' idiosyncratic flavour of ignorance. Implementing Socrates' infamous dictum – I know that I don't know – the study demonstrates how gazing through the prism of the locality premise creates scattered patterns of self-referential paradoxes and self-defeating scientific-logical suppositions. Subsequently the study illustrates that if, conversely, localized thought rather passes through the prism of the non-locality premise, the jumbled dissymmetries emanating from the locality prism are transfigured into symmetrical patterns of logical beauty.

Concerning the notion of symmetry, the study explicates the importance there-of in terms of the non-locality premise by defining and differentiating the symmetrical [R] and the symmetrical [I]. The study evidences the pragmatic efficacy the notion of symmetry has already provided for the domain of physics in the past, and considers the vital importance of investigating the clinical applicability this notion might have for the domain of psychology in the future. This preliminary disquisition concerning the premise of non-locality is summarized in the conceptualisation of the 'power to will'. The *power to will* evinces an alternative approach for addressing the paradigmatic reprise (postulated in terms of the 'brilliant Greek mistake') that confronts the post-modern mind.

Opsomming

Die studie identifiseer 'n basiese psigo-logika aanname, benoem die premis van lokaliteit, wat gepostuleer word deur die outeur om die meerderheid van historiese en kontemporêre sielkundige, filosofiese en wetenskaplike denke te deur grens. In ag nemend van die voorafgaande supposisie eksploreer die studie die domein van kwantum fisika, vanwaar 'n alternatiewe psigo-logika aanname, die premis van non-lokaliteit, gekonseptualiseer word. Die semantiese implikasies van die non-lokaliteits premis word uiteengesit deur die betekenis, karakter en simptome van die lokaliteits-premis te ondersoek. Die indikatiewe faktore van die lokaliteits-premis word aangedui en gevolglik geartikuleer in terme van die sielkundige denke van Jacques Lacan. Die studie demonstreer hoe die implisiete lokaliteits aannames in Lacan se gedagte gang die oorsprong is van die teenstrydighede tussen sy spieël-fase formulasie en die empiriese bevindinge van kontemporêre spieël self-erkenning. Gebaseer op die basis van die non-lokaliteits aanname ontwikkel die outeur 'n psigologiese persepsie struktuur, benoem die digotomiese subjek objektifikasie. Digotomiese subjek objektifikasie verteenwoordig die gelokaliseerde ervaring van die self as subjek wat gekarakteriseer word deur die vermoeë om die self in die spieël te erken. Geintuïteer deur die aanname van non-lokaliteit, stel die outeur die idee van 'nie-lokale perceptum' bekend. Die fisiologiese dinamiek van nie-lokale perceptum word gekonseptualiseer deur die betekenis van 'absolute krag state' te verduidelik. Die disposisie van absolute krag state in terme van digotomiese subjek objektifikasie word gefunksionaliseer deur die verband daarvan met Michel Foucault se konseptualisering van 'krag-relasies' aan te dui. Met betrekking tot die voorafgaande word spesifike aandag gegee aan Foucault se verstaan van die dispariteit tussen dissiplinêre krag en soewereniteite krag; die moontlike invloed van hierdie dispariteit op die individuele psige is ondersoek en 'n tipe 'kognitiewe dissonansie' is geidentifiseer. Gelokaliseerde sielkundige ervaring wat voortvloei uit nie-lokale perceptum is verder belig deur 'n verduideliking van die logiese relevansie van Sokrates se idiosinkratiese geur van onkunde. Deur die implementering van Sokrates se berugte uitspraak – 'Ek weet dat ek nie weet nie', demonstreer die studie hoe sig deur die prisma van die lokaliteits aanname onreëlmatige patrone van self-referentiële paradokse en self-ondermynende wetenskaplike-logiese supposisies waarneem.

Vervolglik illustreer die studie, in die opsig van ’n omgekeerde perspektief, dat as gelokaliseerde denke eerder deur die prisma van die non-lokaliteits aanname beweeg, die deurmekaar dissimmetrie wat deur die lokaliteits prisma straal getransformeer word in logiese patrone van logiese skoonheid. Aangaande die idee van simmetrie, bestudeer die studie die belangrikheid daarvan in terme van die non-lokaliteits aanname deur die definieering en differensieering van die simmetries [R] en die simmetriese [I]. Die studie illustreer die pragmatiese werksaamheid wat die idee van simmetrie al reeds in die verlede behels het vir die domein van fisika, en oorweeg die fundamentele belangrikheid om in die toekoms die kliniese moontlikhede van hierdie idee ten opsigte van die veld van sielkunde te ondersoek. Ten slotte is hierdie voorlopige bespreking van die aanname van non-lokaliteit saamgevat in die konseptualisering van ‘krag tot wil’. Die *krag tot wil* ontbloot ’n alternatiewe benadering om die paradigmatiese herhaling (gepostuleer in terme van die ‘briljante Griekse fout’) wat die post-moderne psige konfronteer aan te spreek.

Opgedra aan my ouma Hettie,

vir haar knielende gebed, en

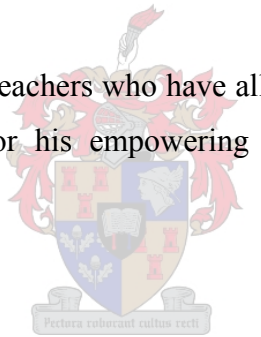
dié erkennende oomblik van stilte.

Acknowledgements

I would like to express my gratitude to the people without whose help, guidance and sacrifices this thesis could never have been written: Special thanks to my supervisor, Dr. De Vos, for allowing me to explore my truth, his gentle understanding, and his courage to walk down this daunting and obscure pathway alongside me (thanks also for the golf, even though concerning this pathway we were mostly unable to walk down the fairway together!). My fellow master students, Marieanna, Prof. Möller, and the staff of the library – your presence and contributions are greatly appreciated.

I would like to thank my father and brother for their unwavering support, and also for their willingness to experience my struggle and conflict with me. To my mother, the single greatest influence in my life, for giving me the greatest gift a mother can – a loving belief in her son.

Lastly I would like to thank the teachers who have allowed me to dream: Socrates for his guiding wisdom, Gandhi for his empowering Truth, and John Lennon (The Beatles) for his inspiring music.



“Thus stood the figure of Socrates for Plato – the resolution and climax of the Greek quest for truth, the restorer of the world’s divine foundation, the awakener of the human intellect.”

- Tarnas (1991)

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Section 1

1. Introduction

1.1 Objective of the study

The study represents an interdomain investigation directed towards firstly: excavating a foundational psycho-logico assumption postulated by the author to permeate most of historical and contemporary scientific, psychological and philosophical thought; and secondly: positing a new psycho-logico assumption grounded in the empirical domain of quantum physics.

The clandestine and deceptive old foundational assumption will be conceptualized in terms of 'the premise of locality'. The meaning, character and symptoms of the premise of locality will be explored, and the author will demonstrate that 'even' a post-modernistic theoretical and clinical endeavour like that of the French psychiatrist Jacques Lacan, does not escape the pseudo-transparent and malleable claws of the premise of locality. Analogously the nature of the study can be envisaged as follows: Up until the 17th century astronomers believed that the earth was fixed at the centre of the universe and that all the heavenly bodies, including the sun, revolved around the earth. The astronomers of the Renaissance had 'good' rational and logical reasons to adhere to a geocentric view of the universe: the predominant religious paradigm at the time of Copernicus dictated that Man, made in God's image, was the epitome of God's creation, and consequently it was only rational to suppose that the earth, Man's ephemeral home, was at the centre of the universe; also, if the earth revolved or rotated, it is only logical to suppose that man would be aware or feel the movement of the earth, in fact, if the earth rotated one would expect to see people falling off and pieces of earth flying apart - remember that at the beginning of the 17th century gravity had not yet been conceptualized by Newton (Tarnas, 1991)! Furthermore, the Ptolemy astronomical model, describing a geocentric universe, possessed an error of approximately 1% (Pine, 1988). Thus, disconcertingly, the Ptolemy mathematical system described the planetary movements 99% accurately, yet the wrong centre was assumed! It took the insight and labour of Nicolaus Copernicus and subsequently Johannes Kepler to demonstrate that a heliocentric universe was mathematically more

eloquent and predictively more accurate than the geocentric model of Ptolemy - a paradigmatic shift stretching over a period of more or less two centuries. The author supposes analogously that modern day psychological and philosophical thought is still trapped in a geocentric universe paradigm in the simulacrum of the premise of locality. This study undertakes to describe a heliocentric universe by allowing a premise of non-locality to occupy the position of the sun.

To facilitate in the development of a theoretical model for this new heliocentric universe, a model that accounts for localized phenomena in terms of non-locality, the author will implement a post-structuralist line of thought protruding from the intellectual endeavours of Michel Foucault. Specific attention will be given to Foucault's notion of power relations.

Furthermore, in order to clarify the semantic implications of a premise of non-locality and to illustrate the vital importance for mankind to challenge the premise of locality and all its faces, the author will draw a comparison between the socio-intellectual patterns of Ancient Greece and that of the globalised society of the third millennium. The latter will be formulated in terms of 'the brilliant Greek mistake' and will be expounded in the conclusion section.

The study will employ a methodological approach that acknowledges two key paradigms related to scientific investigation, these paradigms are the two archetypal patterns distinguished by James Hillman (1967) – senex (Latin for 'old man'), and puer (Latin for 'young man'). The archetype of senex represents the wisdom of the old man. It is a mental approach characterized by a need for order, a definite preference for tradition, and a quest for rules and regularities. This archetype emphasizes an appreciation of history and of the past, and evinces a slightly depressive undercurrent. The archetype of puer represents the spontaneity and idealism of youth. It involves a need for change, experimentation and adventure. The puer focuses on the here and now, envisages the future, and emphasizes the transcendence of tradition, laws and rules. According to Hillman both paradigms should be used in any attempt to study and understand human beings. He proposes a paradoxical reconciliation between the scientific thinking of the senex and the poetic thinking of the puer, with neither paradigm dominating the other. This thesis will

utilize the framework of the senex to explore and discover the possibilities of the puer.

1.2 Outline of the study

Section 2 will sketch the birth and development of the concept of non-locality in the world of quantum physics. The author will demonstrate how, over the course of the 20th century, various empirical experiments, thought experiments, mathematical formulae, and theorems converged to produce the notion of non-locality.
Section 3 is an exposition of pertinent Lacanian theory that will provide a rational matrix upon which the premise of locality will be articulated. This matrix of Lacanian thought will as such establish an alternate frame of reference to facilitate an illumination of the gist of the premise of non-locality. Beyond rendering a premise of locality intelligible and exposing the multifarious faces there-of, the latter exposition will also serve as a base whence possible conceptual errors related to Lacan's description of the mirror stage will be investigated (see section 4).

Section 4 begins by examining the physiological human brain to substantiate the extrapolation of two distinct yet intricately intertwined functional dynamics of the human psyche - the rational-element and the emotional-element. The conditioned and contingent nature of rationality will be explicated, and the 'amalgamated relation' of the rational-element and the emotional-element will be conceptualized. The developmental process of becoming aware of the self as a subject will be analysed by considering contemporary research findings related to self- and other-awareness, and by examining the implications of the human cognitive capability to recognize the mirror image as one's own. The investigation of the research domain of mirror self-recognition will consequently be implemented to critique Lacan's formulation of the mirror-stage. The critique will illustrate how Lacan's non-recognition of the primary significance of the cognitive capacity for detecting and producing symmetrical movements, erroneously lead Lacan to conceptualize his particular flavour of the decentred ego with its nihilistic taste. A premise of non-locality attributes fundamental importance to the principle of symmetry (see also section 6), hence the principle of symmetry will be utilized to develop a perception model and to explicate the rational and emotional dynamics that fabricate a sense of desire.

The developed perception structure is coined – dichotomous subject objectification (or just called 'objectification'). The second half of section 4 will outline the topographical constitution of the latter objectification and describe the dynamic and discontinuous processes that drive the form there-of. For clarification purposes the differentiated forms of dichotomous subject objectification will be correlated with prominent psychological theory of the 20th century specifically focused on the anatomy and physiology of perceptive experience. Dichotomous subject objectification represents a specific configuration of the rational-element and emotional-element, and animates, in varying degrees of complexity, the perceptive world of all biological species capable of recognizing the self in the mirror.

Section 4 concludes with the introduction of a third element – the intuitive-element ([I]-element). The conceptualization of the intuitive-element is a direct consequence of the premise of non-locality. The intuitive-element dictates a new and peculiar form of logic, the semantic status of which will be expressed by means of Socrates' idiosyncratic ignorance. Various traditionally problematic and paradoxical scientific and philosophical propositions will be evaluated in terms of the intuitive-element (see also section 5.3), thus envisaging the implications of a reality that ascribes to the logical inferences of a premise of non-locality.

Section 5 formulates the notion of absolute power states to describe possible processes involved in the localized precipitation of non-local perceptum (the concept of non-local perceptum is explained in section 4). Dichotomous subject objectifications will be correlated with Michel Foucault's formulation of power relations, consequently allowing a particular network configuration of objectifications to be depicted. The latter, through the physical organization of bodies and the psychological interpretation of these localized phenomena, will serve as exemplar to characterize a possible pattern derived from the intra-relation (specifically not inter-relation) of objectifications and absolute power states.

Section 6 will diagnose the significance of symmetry, explore the various forms there-of, and consequently indicate how the notion of symmetry evolves in complexity - from animating the basic rational and emotional experience of the self as subject, to forming the nucleus of the most brilliant and influential scientific theories of the 20th

century. The principle of symmetry will be implemented (specifically in the form of the symmetrical [I]) to throw light on the dynamics of absolute power states. Symbolically the symmetrical characterization of absolute power states will provide the fertile ground in which various strands of deduction and inference will germinate and conjoin to ultimately blossom into the rose of *power to will*. The concept of *power to will* provides a novel methodological matrix for the potential development of specific therapeutic technologies in the domain of psychology.

Section 2

2. The Quantum world

Then John the quantum physicist spoke and said unto the people thus:

> "In the beginning there was locality - locality was with non-locality and locality self was non-locality. Already in the beginning this was so. In locality there was symmetry and this symmetry was the light for the people."[1]

The scientific voyage of our species into the unchartered waters of the quantum world has exposed human logic to iconoclastic phenomena that mercilessly and relentlessly toss the grand ship of rationality amongst the waves of irrationality. Physicists' journey into the atom has been truly extravagant. The enamoured notions of classical physics have been vehemently deposed from their objective pedestal and relegated to the delimiting chairs of subjectivity. Quantum mechanics has not been a friendly science, it has demolished classical concepts such as scientific objectivity, solid objects and strictly deterministic laws of nature.

In quantum physics it is superfluous to consider the scientist to play the role of a detached and objective witness observing an independent outside world. The observer becomes involved in the world he/she observes to the extent that he/she influences the properties of the observed objects. John Wheeler (quoted in Capra, 1999) suggests replacing the word *observer* with the word *participator* and regards this as the most important feature of quantum theory. Not only does the act of measurement significantly influence the results, but the way the experiment is set-up will determine, to some extend, the properties of the observed object. If the experimental arrangement is modified, the properties of the observed object also change. Hence the notion that the description of light as particle-like or wave-like or particle-wave-like are not descriptions of the properties of light, rather they are descriptions of our interactions with light.

[1] Personal formulation by author – alluding to the introductory verse of the book of John (New Testament).

At the subatomic level a particle like an electron can't be said to posses a definite position, but rather exhibits 'tendencies' to occur at certain places. These tendencies are expressed in the formalism of quantum theory as probabilities and are associated with mathematical quantities that take the form of waves. These waves are not typical sound or water waves, they are what might be called 'probability waves'- abstract mathematical quantities with all the characteristic properties of waves which are related to the probabilities of finding the particles at particular points in space and at particular times (Capra, 1999). This of course is already a contradiction – describing the occurrence of particles using wave characteristics. To illustrate and make sense of such a contradiction the author will describe experiments and principles that are fundamental to quantum physics and pertinent to the endeavours of this investigation. The author will explicate central findings and deductions that will converge to form an understanding of what a premise of non-locality entails.

2. 1 The two-slit experiment.

The two-slit experiment is simple to perform given the right apparatus, and has been conducted many times in many different ways (this experiment can be read in most books on quantum physics). It is basically concerned with the nature of light and is designed to determine whether light is composed of particles or whether light is wave-like. The wave-particle question of light had become a very ambiguous state of affairs by the beginning of the 20th century. Either light is a stream of particles or it is wave-like, it can't be both. In 1803 Thomas Young had conducted what is now called 'Young's slits experiment' and showed beyond doubt (or so it was thought back then) that light was a wave. But then, a century after Young's experiments, Albert Einstein published a theoretical physics paper describing the origin of what is known as the 'photoelectric effect', which was logical only if light was understood to be a stream of particles (a light particle is called a photon). Thus Einstein's light-particle theory contradicted Young's wave theory without disproving it. This was the background for the two-slit experiment (Zukav, 1991).

First, a beam of light is shone on a screen containing two narrow slits that allow some of the light to pass through to a second screen where an interference pattern is seen.

This interference pattern (alternating light and dark bands) is indicative of light behaving as a wave. Now the experimenter performs the experiment using a 'light gun' to fire one photon (a particle) at a time and closes one of the slits. After a succession of these photons have been fired the distribution of spots on the second screen resembles a pattern that can be expected if it were particles moving through the open slit. But now comes the interesting part: if the experimenter opens both slits and fires one photon at a time (assumed to be a particle not a wave) the pattern that forms is again typical of a wave. What is strange is that the photons never lands in the same area as was the case with only one slit open. Every single photon seems to somehow know whether the there are two slits open or just one (Al-Khalili, 2003).

To reiterate: each light particle fired from the gun leaves it as a tiny 'localized' particle and arrives at the second screen also as a particle. But in between something mysterious takes place, it seems as if the particle is behaving like a spread-out wave that gets split into two components, each emerging from a slit and interfering with the other on the other side. In particle language physicists would have to say that it appears as if the photon passes through both slits, which of course does not seem feasible. So what the experimenters now do is to try and determine through which one of the slits the photon passes by setting up a photon detector behind one of the slits. Every time a photon passes through this slit it is registered on the detector. The results that follow are spooky. Once enough photons have registered a signal in the detector as they pass through the slit that is under surveillance and it can be expected that more or less half went through one slit and half through the other, it is found that the interference pattern disappears! The distribution of spots on the second screen now form a pattern typical of particle behaviour, not even remotely resembling wave-like behaviour. Thus it would seem that light behaves in a wave-like manner when we are not attempting to detect it, but behaves as particles when we do try to detect it. Variants of this experiment have been performed to try and 'catch-out' the photon, but to no avail. This wave-particle duality has also been found in atoms and large molecules (Al-Khalili, 2003).

Quantum mechanics provides a perfectly logical explanation for the two-slit experiment. But it is an explanation that is concerned only with what is observed and not with what is happening when the experimenter is not looking – and it is here that

we find the rudimentary anticipation of non-locality. The following sections will formulate a condensed exposition of the central quantum mechanics principles pertinent to a succinct understanding of a non-locality premise.

2. 2 Probability and uncertainty

In the quantum world physicists are confronted with a very serious kind of unpredictability that can't be blamed on their ignorance of the details of a system being studied, or a practical inability to set the initial conditions. It appears this unpredictability is an essential feature of nature self at this level. Quantum physicists can't predict with certainty what will happen next in the quantum domain, not because their theories aren't good enough or because they lack sufficient information, but because nature self seems to operate in a very elusive fashion (Al-Khalili, 2003). Quantum physicists have developed mathematical equations that allow them to predict the *probabilities* of certain results provided the experiments are performed in a certain way. The purpose of quantum mechanics is not to predict what happens in actuality, but to predict the probabilities of various possible results. For example – Quantum physicists can't calculate where a single photon in the double-slit experiment will strike the photographic plate. They can however calculate with precision the probability that it will strike at a certain place, provided that the experiment has been prepared properly (Zukav, 1991). Quantum probabilities are built into the theory itself and physicists can't, even in principle, do any better.

At the heart of the strange and probabilistic concepts forced upon physicists by quantum mechanics, lies the wave function. The wave function is a mathematical quantity obtained by solving Schrödinger's wave equation that contains all the possible information we can obtain about a quantum system - observed system interacting with an observing/measuring system (Hawking, 2001). It is important to note that the wave function deals with possibilities and not probabilities. In the sense that it is possible that it might snow in Stellenbosch for the whole duration of winter, yet it is not probable. The wave function is related to probability in the following way: once the wave function is calculated a simple mathematical operation can be performed on it to create a second mathematical entity called a probability function

(technically a 'probability wave function'). The probability function conveys the probabilities at given times of each of the possibilities represented by the wave function (Zukav, 1991).

Take for example an electron in a box: if we know that an electron started off in one of the top corners of the box, then its wave function will after a short time have spread out to occupy the whole volume of the box. As such the movement of the particle resembles the way a wave evolves. However, the higher density of probability, calculated from the wave function, tells us that the electron is more likely to be found near its original location, were we to look for it (Lockwood, 1989). As time goes by the probability cloud – not a physical cloud describing a 'smeared out' electron, but simply a mathematical cloud of probability – will spread out more evenly and the electron will have an equal chance of being found anywhere in the box (Al-Khalili, 2003).

The wave function development follows an unvarying determinism and since the probability function is based upon the wave function, the probabilities of possible happenings also develop deterministically via the Schrodinger equation (Hawking, 2001). This explains why physicists can accurately predict the probability of an event, but not the event itself. The probability of a desired result can be calculated, but when a measurement is made (try to observe the movement of the particle), the result may or may not be what we get. The photon may land in region A or it may land in region B. Which possibility becomes reality is, according to quantum theory, a matter of chance.

Before the study investigates how the wave function can be interpreted for example in context of the two-slit experiment, the author will briefly enunciate what is called – Heisenberg's uncertainty principle. This will help provide a background that will facilitate a better understanding of the Einstein-Podolsky-Rosen experiment where non-locality was first conceptually deduced. The uncertainty principle is an example of the indeterminacy of the quantum world and states that one can never know at the same time, and with total precision, everything about a quantum system, even if one tries to measure it. In its mathematical form it says that the experimenter can never know at the same time the precise location and velocity of a photon or any other

quantum entity (Lockwood, 1989). Thus the more the experimenter knows about the velocity (momentum) of a photon, the less the he/she will know about its position.

The relation between the uncertainties of a particle's position is not the only form of the uncertainty principle. Other quantities also demonstrate similar relations, for example the time an atomic event takes and the energy it involves (Capra, 1999). Events occurring inside a short time span involve a large uncertainty in energy; events involving a precise amount of energy can be localized only within a long period of time. To help the reader form a more integrated picture it can be added that Heisenberg's uncertainty principle is a consequence of the relation between two types of wave functions – the position wave function (as discussed above), and another wave function called the momentum wave function, which describes the particle's possible location and state of motion even before we look (Al-Khalili, 2003).

The discussion will now focus on how one can logically make sense of the reality that the wave function describes in context of the two-slit experiment.
Each photon (or any other quantum particle) fired at the screen with two open slits is described by a wave function that evolves in time. The photon must not be regarded as having suddenly turned into a spread-out wave function, the wave function as a mathematical fiction serves as the only means for tracking the atom from the moment it is fired untill the moment it hits the screen. The wave function – being spread out – splits in two on encountering the slits with each piece going through one of the slits. Al-Khalili (2003) notes that this is a description of a changing mathematical entity and that it is by solving the Schrödinger equation that one can tell what the wave function looks like at any given time. One can never know what is really going on, or even be sure that anything real is going on at all, since this would require making a measurement, but as soon as this is done the outcome will be altered. As the photon moves through both slits, its wave function is a superposition of two parts. Superposition refers to the process whereby two waves (in this case wave functions) are added together (Zukav, 1999). The movement of the photon must not be regarded as typical wave-like movement, because the wave function seems to exist in two isolated parts during this phase of the experiment. So the single particle now behaves as though it were two particles that are identical to the original particle. If the state of the photon was described by only one of these parts of the wave function then it

would be possible to say that the photon was definitely going through one of the slits. But the superposition of the two parts means that there is equal chance of it passing through either slit.

On the other side of the slits, each piece of the wave function spreads out again and both sets of ripples overlap in such a way that a stripy pattern characteristic of two real interfering waves form on the screen (Al-Khalili, 2003). It must be made clear that the pattern is not due to a real wave, but rather a set of numbers that provide us with a probability for the arrival of a single particle at a given location. Of course, as discussed earlier, if the experimenter was to try and observe/measure the particle as it passes through one of the slits, the interference pattern disappears and a pattern typical of the movement one would expect of a particle appears in its place. Alternatively formulated: An interference pattern is produced when the two paths are indistinguishable, but as soon as the experimenter attempts to detect the particle the two paths will produce distinguishable photons and the interference pattern disappears (Al-Khalili, 2003). The moment a photon is detected going through one of the slits, the possibility that it would go through the other slit ceases to exist – the probability of detecting the photon at the other slit becomes zero. The wave function is said to collapse. This phenomenon is simply called the 'collapse of the wave function' (Penrose, 1989). The probability that the photon passed through the slit where it was detected is now one. Thus, if we do not look to see where the photon is it does not go through one slit or the other, but must be regarded as having gone through both slits at once. This is a necessary deduction if we are to explain the interference pattern. These results are further supported by experiments using what is called 'an interferometer'- with these experiments the results are only in intelligible if we accept that a single particle somehow travels two different paths at once (Al-Khalili, 2003). Welcome to the world of non-locality.

What is meant or implied by non-locality? As a matter of definition the following: Instantaneous connections ubiquitous to the physical universe – a network of connections unapparent to the sensory experience of the macroscopic world, thus permitting one to speak of separate objects and to formulate laws to describe their behaviour in terms of certainties. However, if one looks at the macroscopic world through a magnifying lens, or in other terms, if one investigates the atomic world, the

influence of non-local connections become more *apparent* (important to note – not *stronger*), certainties give way to probabilities and it becomes more and more difficult to differentiate any part of the physical universe from any other part there-of. Physicists are no longer in doubt that instantaneous communication (faster than the speed of light) between distant objects, or non-locality, is a fundamental feature of the quantum world, and can be traced back to the nature of the wave function (Al-Khalili, 2003).

Before the author succinctly explicates the notion of non-locality and its conceptual origins, it is necessary to distinguish between the following two quantum concepts: non-locality and entanglement. Entanglement can be considered to be a combination of non-locality and superposition (Al-Khalili, 2003). Superposition can be considered, in context of the wave-particle duality (see also earlier definition), to refer to the property of a quantum particle where the particle can exist in a combination of two or more states at the same time (Zukav, 1991). If the idea of superposition is synthesized with the non-locality idea of instantaneous connection, the result is the dialectical notion of a particle that can exist in two places at once (if we do not attempt to observe it) with its different parts being able to instantaneously influence each. Two originally distinct and separate particles can also become 'entangled' in the sense that their interaction causes them to become correlated in such a way that their fates will be intertwined forever, however far apart they get – until, that is, one of them interacts with a measuring device. Consequently it should be clear that non-locality and entanglement are interrelated concepts and for the purposes of this thesis the author will especially make use of the word non-locality. To be sure, entanglement as a phenomenon would not be possible if non-locality was to be spurious. As it is, physicists accept non-locality and entanglement as crucial features of the quantum world (Al-Khalili).

Interpreting quantum phenomena is not inevitably delimited to the postulation of non-locality. In fact, the first consistent formulation of quantum mechanics assumed the form of the 'Copenhagen interpretation'. It was developed through discussions that took place in the mid- and late-1920s between Niels Bohr and a group of brilliant young geniuses, including Werner Heisenberg (recall Heisenberg's uncertainty principle), that were gathered together at Bohr's then-new science institute. The

Copenhagen interpretation says, in effect, that it does not matter what quantum mechanics is about, what matters is that it works in all possible experimental situations (Zukav, 1991). Strictly speaking the Copenhagen interpretation is not a real interpretation. Consider for example the EPR-experiment: the difficulty with the experiment is that it represents the experimenter with a set of correlations for which there appears to be no classical explanation (including Newtonian and Einsteinian physics). The Copenhagen interpretation represents nothing more than a recipe for how to compute what the correlations are. As such the computational algorithm adopts the status of a complete explanation. The Copenhagen interpretation merely provides a set of rules to abide by in order for the experimenter to make use of the quantum formalism without being concerned about its meaning. According to Al-Khalili (2003), the Copenhagen interpretation not only does not explain how the photon/atom goes through the two slits, the interpretation states categorically that even to ask such a question is meaningless – denying that an objective reality exists in the absence of observation. Therefore the Copenhagen interpretation succeeds in banishing logical contradictions and inconsistencies by only allowing those questions to be posed that concern the results of the measurements.

In context of this thesis, the logical contradictions and inconsistencies of quantum phenomena will be addressed and the possible semantic indications there-of formulated in terms of the conceptualization of non-locality as premise.

In the following section the author will describe the Einstein-Podolsky-Rosen thought experiment where Einstein and his two colleagues wholly unintentionally stumbled over the notion of non-locality.

2. 3 The EPR experiment

Einstein, Podolsky, and Rosen (1935) published a paper entitled, “Can Quantum-Mechanical Description of Physical Reality be Considered Complete?”. At the time Einstein was troubled by the concept of indeterminacy, whereby quantum mechanics insists that we can’t know everything about a quantum particle at the same time (recall the earlier explication of Heisenberg’s uncertainty principle). The thought experiment was designed to demonstrate that the quantum theory was not a

'complete' theory because it does not describe certain important aspects of reality which are physically real even if they are not observed, for example: the quantum principle that a particle doesn't have a well-defined position unless we look at it. The ultimate implications of the thought experiment were very far removed from its original intentions, and instead a spooky yet fundamental feature of the physical world was revealed – non-locality. The EPR experiment can be regarded as the Pandora's box of modern physics.

The experiment can be described as follows (Einstein et al., 1935): Consider two quantum particles, such as photons, that are simultaneously produced by a common source and which move apart with equal and opposite velocities. In light of the foregoing discussion it should be clear that each of the two photons must be considered as being like a spread-out wave until it is detected. This is logically so because of the two-slit experiment where the spots on the second screen where the photons end up is dictated by the interference pattern in its wave function - each photon behaving like a wave before it is detected and like a particle when it is detected. Please appreciate the ingenuity of the argument that follows. If the experimenter chooses to measure the precise position of the first particle then it would appear as a localized particle. The experimenter would also know the precise location of the second photon at that moment without looking at it (without any measurement), since it would have travelled an equal distance on the other side of the source. Alternatively, the experimenter can choose to measure the wave-like properties of the first photon, such as its wavelength, calculated from the measured momentum (this calculation is done using de Broglie's formula whereby the momentum of a particle is related to its wavelength). And since the two photons have the same magnitude of momentum – but travelling in opposite directions – the second photon's precise momentum can also be known and a precise wave length can be calculated for it. Thus both photons can now be described as behaving like waves.

It is clear from the above that what the experimenter chooses to measure of the first photon, determines what characteristics are assigned to it. It is important to note that the experimenter has not touched the second photon throughout. The experimenter could have ensured that the second photon is not disturbed by allowing enough time to elapse so that the two particles are very far apart. By doing this the experimenter

would have avoided any signalling at the speed of light taking place between the two particles (thus avoiding that they disturb each other) – it should be emphasized that photons are light particles and thus move away from each other at the speed of light. Thus any signal moving at the speed of light would be unable to catch up with the photon that is also moving at the speed of light. This is necessarily so for the argument Einstein presents, because according to his 'special theory of relativity' (which should not be confused with his later general theory of relativity that incorporates gravity) nothing can travel faster than the speed of light – the speed of light is invariably 186,000 miles per second (in a vacuum – the speed of light changes in matter depending on the index of refraction of the matter) (Zukav, 1991).

The major point Einstein wanted to make was that the experimenter could in principle, have known either the undisturbed photon's precise position (particle nature) or its precise momentum (wave nature) at any given time *without looking at it* (*without making a measurement*). What is important is that, according to Einstein, the second photon must have had a definite position and momentum all along. This contradicts the quantum mechanical principle that a particle can't be said to posses any definite position or momentum (never mind a definite position *and* momentum – recall Heisenberg's uncertainty principle) *if one does not perform a measurement* – due to the probabilistic nature of the wave function.

Thus the experiment seemed to demonstrate that quantum theory was an incomplete theory. But such a conclusion could be avoided as Einstein (quoted in Zukav, 1991) admitted in the paper with the following ironic aside:

> One can escape from this conclusion [that quantum theory is incomplete] only by either assuming that the measurement of S1 [1st photon] telepathically changes the real situation of S2 [2nd photon] or by denying independent real situations as such to things which are spatially separated from each other. Both alternatives appear to me to be entirely unacceptable. (p. 305)

Here we have the rudimentary rumblings of non-locality. What Einstein indirectly acknowledges in this paragraph is an implicit assumption in their argument – the principle of local causes. This principle advocates that what happens in one area does

not depend upon variables subject to the control of an experimenter in a distant and space-like separated area. Einstein explicitly reiterates this principle in his autobiography (quoted in Zukav, 1991) written 11 years after the Einstein-Podolsky-Rosen paper:

> …on one supposition we should, in my opinion, absolutely hold fast: the real factual situation of the system S2 [the particle in area B] is independent of what is done with the system S1 [the particle in area A], which is spatially separated from the former. (p. 304)

So for quantum theory to not be seriously flawed, there would have to be some kind of non-local communication taking place between two spatially separated particles, as such contradicting the common sense notion of local causes.

Using the idea of the wave function, the EPR experiment can be readily explained: once the two photons have interacted, they will thereafter be described by the same entangled wave function and their fates will be intertwined however far apart they become. The moment a property of one of the photons is measured, the entangled wave function collapses and the other photon is instantly endowed with the corresponding property. This explanation supposes the possibility of non-local connections. And it is exactly these non-local connections that Einstein couldn't accept. The dilemma Einstein faced was that the statistical predictions of quantum mechanics are always correct. Quantum mechanics predicts very precisely the properties of atoms and molecules and their constituent particles, it explains everything from transistors to radioactive decay to stellar energy (Al-Khalili, 2003). If ever there was a successful scientific theory, quantum mechanics is it. The problem with quantum mechanics is that nobody knows why it works!

Then in 1964, John Bell (an Irish physicist) seriously tackled the unresolved issue of local causes (Einstein's argument) versus non-local connections (Quantum mechanics) and proposed a way of testing which one of these two notions are correct – it was called Bell's theorem or Bell's inequality. It is regarded by many as one of the most profound scientific discoveries of the 20th century (Al-Khalili, 2003). Stapp (1975), in a work supported by the U.S. Energy Research and Development

Administration, described the theorem as follows, "Bell's theorem is the most profound discovery of science" (p. 271). For the purposes of this investigation it will be sufficient to outline the basic gist of this theorem without considering the details of the experimental set-up required to test Bell's theorem.

Bell's theorem is a mathematical proof (Penrose, 1989). If it is correct then Einstein was wrong and quantum mechanics right. The reason being the following: Einstein was of the opinion that there was nothing strange about the occurrence that the two EPR-set-up particles were found to have correlated properties when measured. After all they had been emitted by the same source and had thus been in contact in the past. Accordingly, no faster-than-light signalling between them need be invoked if their properties had been set from the start (remember that the special theory of relativity forbids faster-than-light-movement). Einstein believed that there was some real objective reality out there to measure/discover, and that as a consequence particles like photons and electrons must posses real properties even when the experimenter is not looking – that an electron particle exists as a definite electron particle without an observer needing to observe it. These well-defined real properties, which quantum mechanics does not describe in the absence of a measurement, are designated as 'hidden variables', and do not require any non-locality, a concept Einstein was never comfortable with. Now the question is – Was Einstein correct? Could 'hidden variables' explain quantum weirdness?

Bell's theorem transposed the argument about the nature of quantum reality from the realm of philosophy to experimental physics (Al-Khalili, 2003). Bell derived a formula which indicated that if the principle of local causes is valid, and Einstein is thus correct, then there would have to be a maximum amount (a ceiling value you might say) of correlation between the two particles. That is, since the particles could have no prior knowledge of the type of measurement that would be performed on each of them, the conspiratorial preparation that could be built into them was limited. Hence in the case of hidden variables that predefine both particles' properties, there is a limit to the synchronization between the results of measurements on the two particles. Alternatively, if quantum mechanics and the concept of a single wave function describing the entangled state of the pair were correct, then there would be a larger amount of correlation than this maxim. The results obtained from the

experiments performed to test Bell's theorem are the reason why the reader is reading this thesis.

Back in 1964 Bell's experiment was still a hypothetical construct. The technology necessary to perform the experiment had not yet been developed. Eventually in 1972, Clauser and Freedman (1972) performed the experiment to confirm whether the statistical predictions of quantum mechanics or the principle of local causes is false. They found that the statistical predictions upon which Bell based his theorem were correct, but the experiment did not conclusively demonstrate that these correlations were the result of non-local connections (this was due to certain technical inadequacies of the experiment). The experiment that was to deliver the knockout blow to the principle of local causes and declare non-locality the winner, was carried out in 1981 by a team of physicists led by Alain Aspect (cited in Calder, 2003). The experimental results indicated that Bell's inequality was violated and consequently that non-locality, strange as it may be, was in fact a fundamental feature of nature. Almost 50 years after the publication of the EPR-paper, the concept Einstein postulated to demonstrate that quantum mechanics was 'an incomplete' theory, was experimentally substantiated and as a consequence exactly the converse was indicated – quantum mechanics really is non-local, or as Einstein preferred to say, it involves 'spooky action at a distance'.

Presently the principle of non-locality is utilized in a multitude of technological devices – to name but a few: superconductors (utilizing Cooper-pairs), lasers (thus in DVD and CD players, eye-surgery), quantum cryptography, and tunnel diodes (used as very fast switches in microprocessors) (Al-Khalili, 2003).

Bell's theorem demonstrates that not only are 'common sense ideas' inadequate for describing subatomic phenomena, they are also deficient for describing macroscopic events, everyday phenomena (Zukav, 1991)! Essentially there is no such thing as separate parts.

Just as certain as the physical brain is related to psychological phenomena (example – Altzheimers, brain damage), so unequivocally must the features of the subatomic world which essentially constitute the physical brain also be related to psychological

phenomena. Whence non-locality must be related to psychological phenomena. Already in Jungian psychology one finds the idea of synchronicity – the notion that two events can be a-causally related (non-locally intertwined) in a meaningful way. But now, during this theoretical endeavour, the author will descend much deeper, to be sure, non-locality will be postulated as the premise for all psychological phenomena (all physical phenomena as well).

As fundamental as atoms and molecules are to the brain as a whole organ, so fundamental the author postulates non-locality to be to all cognitive experience. The postulate assumes that there is some state of reality, some way of being that allows localized perceiving bodies to experience non-local phenomena. In the following sections the author will develop a psychological-model that acknowledges non-local experience and succinctly explicates concomitant phenomena.

Section 3

3. The juxtaposed Lacan

3. 1 Lacan's decentred ego

Before the study proceeds, an exposition of relevant Lacanian notions will be formulated in order to establish an alternate frame of reference that will facilitate in rendering a premise of non-locality intelligible to the reader. If one wishes to grasp the meaning of a non-locality assumption it would be necessary to first fathom what is implied by locality. To this end the author will demonstrate that the Lacanian decentred ego is rife with assumptions of locality – ultimately the determining ingredient regarding the pessimistic pith of this theory. As the thesis of non-locality is developed (in later sections), intricacies of Lacan's description of the human psychological experience will be expounded in the form of a comparative critique. Through such a juxtapositioning of Lacan and the non-locality premise, words will act as a type of rational sonar that maps the semantic state of these two thought systems as the verbal impulses bounce to and fro between them.

Lacan (1966/1977) maintained that his theoretical views were not intended to cover the entire range of human experience, but that his theory was developed with the goal of reinterpreting Freud's work. Accordingly it can be safely deduced that the unconscious played a fundamental role in Lacan's thought. Lacan believed, however, that Freud did not adequately describe how the ego came to be. Freud of course did offer a number of possible answers, like for example: the ego was a projection of the surface of the body, or that one portion of the id undergoes a special development and as such acts as an intermediary between the id and the external world (cited in Hook, Watts & Cockcroft, 2002), also the idea that the ego develops as the child goes through a stage of narcissism between the stages of auto-eroticism and object love (Benvenuto & Kennedy, 1986). Although Freud's explanations of ego development were logically coherent and mutually supportive, Lacan found them to be insufficient in expressing succinctly the precise processes involved in forming the ego. What are the exact psychological experiences and phenomena associated with the construction of an ego? In an attempt to provide a definitive explanation for the ego formation

process, Lacan postulated his mirror stage theory of development. According to Lacan that which is formed during the mirror stage will be the rootstock of later identifications (Lacan, 1966/2001). The mirror stage is central to what Lacan termed the 'Imaginary Order', the first of three distinct yet fundamentally intertwined orders envisaged by Lacan. The other two orders being the 'Symbolic Order' and 'The Real'. The relation of these profoundly heterogeneous orders is illustrated by Lacan using the image of a Borromean knot to symbolise their interconnected nature (Benvenuto & Kennedy, 1986). The latter description intimates that the three orders are linked in such a way that if one order is cut, the other two are set free

The first phase of development, the imaginary order, stretches from immediately after birth to round about 18 - 24 months (Meyer, Moore & Viljoen, 1997) – the age when in general most infants develop the capacity for language. The neonate originally possesses awareness, but not self-awareness. According to Lacan (Hook et al., 2002) the infant experiences the body in a fragmentary fashion (*Corps morcele*), having no definite sense of where the body ends and where the world begins. Originally the infant does not experience the body as a differentiated whole - Lacan refers to the child as the 'hommelette', the little scrambled person - and is incapable of properly controlling his/her flailing arms and legs. At this stage Burr (1995) describes the infant as a heterogeneous, shifting, and centre-less mass of needs and sensations. Lacan postulates that the first awareness of unity only develops during the mirror stage, which occurs around six months (Lacan, 1966/2001). During the mirror stage (or primary narcissistic stage) infants are totally self-focused and do not experience themselves as separate from their mothers – evincing a perceptive state of symbiotic dual unity with the mother. The mother acts as a kind of mirror, a reflective surface in which the infant attempts to discover the self (hence Lacan's analogy of the myth of Narcissus who falls in love with his own image reflected in the water). The mirror stage refers to a particular moment of recognition and jubilation when the infant is moving away from the mother's gaze (Benvenuto & Kennedy, 1986). The infant now appears to be capable of recognizing the image of his/her own body as a *Gestalt* in the mirror. Lacan (1966/2001) states the following:

> Thus, this Gestalt … by these two aspects of its appearance [appears in contrasting size that fixes it and in a symmetry that inverts it], symbolizes the

> mental permanence of the I, at the same time it prefigures its alienating destination; it is still pregnant with the correspondences that unite the I with the statue in which man projects himself… (p. 3)

Thus the infant becomes aware of the self as a differentiated whole and so escapes the helpless, anxiety ridden and fragmented sense of the body by identifying with the external whole image. In Lacan's (1966/2001) own words, "We have only to understand the mirror stage as an identification, in the full sense that analysis gives to the term: namely the transformation that takes place when he assumes an image …" (p. 2).

The infant's mastery of the image fills him/her with triumph and joy as the mirror image anticipates the mastery of the body, which the infant has not yet objectively achieved. Hence, narcissism in this formulation becomes a fundamental aspect of human psychology – in the sense that the infant now falls in love with the external image with which he/she identifies. Evans (1996) points out that this narcissism has both an erotic and aggressive character:

> It is erotic, as the myth of narcissus shows, since the subject is strongly attracted to the gestalt that is his image. It is aggressive, since the wholeness of the image contrasts with the uncoordinated disunity of the subject's real body, and thus seems to threaten the subject with disintegration. (p. 120)

Lacan points out that identification with the mirror image constitutes a form of alienation, since people discover themselves outside themselves, in the mirror. The ego for Lacan is thus formed on the basis of an imaginary relationship the subject (the infant) has with his/her own body. The ego has the illusion of autonomy, existing only as such, and so the subject moves from fragmentation and insufficiency to illusory unity. The ego 'neglects, scotomizes, misconstrues', it is a form of self-denial, even self-deception, since it is not the 'true person' who forms the centre of the personality but a kind of imaginary I (*moi*) (cited in Benvenuto & Kennedy, p. 60). Lacan (1966/2001) refers to the false judgements of the ego as *meconnaissance*, or misknowing. Whence he suggests that people have an almost infinite capacity to deceive themselves, particularly when they are making value judgements about

themselves, or when they are contemplating their own image. Why does the ego lie? Why is it necessary for us to cling to the chimera of wholeness and unity perceived in the external image? Evans (1996) explains as follows:

> The anxiety provoked by this feeling of fragmentation fuels the identification with the image … by which the ego is formed. However, the anticipation of a synthetic ego is henceforth constantly threatened by the memory of this sense of fragmentation, which manifests itself in images of 'castration, emasculation, mutilation, dismemberment, dislocation, evisceration, devouring, bursting open of the body' which haunt the human imagination. (p. 67)

Lacan designates the outside world of reflected images the 'Other'. This Other is something outside the body, not the differentness of another, but the mirror image of the self in the other – it is the Other that is the equivalent of the self. This Other must be differentiated from the Other (small 'o') – only during the Oedipal phase of the symbolic order does the Other that is distinct and different from the subject emerge. The Other may be defined as the totality of alien messages received from the outside world (maternal Other, paternal Other, injunctions of the culture), which have come to be reframed as the subject's own, inner and repressed world (Lang, 1995). The Other can as such be likened to a memory-bank of repressed messages, which continues to operate its effects on the ego in the unconscious realm. Hence Lacan's axiom – 'I am not how I think I am' but 'I am how the Other thinks I am' or alternatively – 'the desire of man is the desire of the Other' (cited in Meyer et al., 1997, p. 233).

The moment a child becomes a language being, the symbiotic dual unity with the mother is broken (Meyer et al., 1997). Discourse with the other (small 'o') shatters the mother-child symbiosis. The child receives a name and identifies with this name. Now identification occurs via a *word* and no longer via an *image*. Thus the child is separated from the Other (here specifically the maternal Other – the mother image) and the dual unity is broken. In the process of language acquisition 'lack' arises (loss of unity with the mother), which translates into a desire for that something that is lacking. Hence the pessimistic tenor of Lacan's theory is declared. To be sure, the original unity is broken forever and will always remain unattainable, thus creating an

enduring desire that can never be satisfied. As such a fundamental 'lack of being' becomes constitutively cemented in the human psychological make-up, forever taunting the subject through unattainable desire.

The ability to interact through symbolic language, signals the beginning of the symbolic order. For the purposes of this investigation the exact processes involved in the establishment of the symbolic I (ego) during the symbolic order will not be explicated in detail (for example the dynamics of the Law of the father/culture). Only the most pertinent aspects will be explored.

Language belongs to the symbolic order, and in Lacan's view, it is through language that the subject can represent desires and feelings, and so conversely it is through the symbolic order that the subject can be represented or constituted. The symbolic order is concerned with the functioning of symbols and symbolic systems, including social and cultural symbolism. Outside this domain of symbolization, hence outside the domain of the subject, Lacan conceptualized the 'Real Order' (Benvenuto & Kennedy, 1986). The value of this third order lies in its limiting function, in that it represents the boundary of the other two orders. It is linked to the dimensions of death and sexuality, and ultimately lies beyond the limits of rational comprehension. Consequently not much can be said about it other than it exists and that it is posited in principle as the negative of the other two orders (Meyer et al., 1997).

Lacan believed that the individual obtains his or her own identity through language. Lacan did not consider people to be free agents who determine their own life paths according to their own free will, but as beings with decentred egos who are at the mercy of the Other and the symbolic order of language. Language is of vital importance for Lacan as can be derived from his phrase – 'the unconscious is structured like a language' (cited in Meyer et al., 1997, p. 232). As such Lacan did not recognize the existence of an original or instinctive unconscious, instead he contended that all contents of the unconscious derive from the outside world via symbolization (Lacan, 1973/1979).

Important to note is the following: The meaning Lacan ascribes to the linguistic terms 'signifier' and 'signified' which are combined to form the concept of 'sign'. In

language there is a phonetic image such as ‘apple’ (signifier) that signifies a corresponding meaning - the concept of an apple (the signified). The correspondence between these two linguistic notions is determined by an arbitrary agreement within the language community, and the meaning of the signifier (image or term) is not fixed (Lacan, 1966/2001). Context determines the semantic content of a signifier.

Lacan interpreted these two elements as distinctly separate and in radical opposition. Lacan emphasized the primacy of the signifier and subsequently relegated the search for the signified or concept to the realm of redundancy. The signified is forever elusive and resists fixating attempts. The same, according to Lacan, does not apply to the signifier. It is revealed in the signifying chain, which is made up of signifiers connected to one another, and it is through this perpetual signification that the subject is constructed (Benvenuto & Kennedy, 1986). So the ad infinitum quest for the concept is vanquished, and is replaced by analysis of the laws of the signifier to uncover the knowledge about the subject.

Lacan (1966/2001) explicates these two elements as follows:

> The first network, that of the signifier, is the synchronic structure of the language material in so far as in that structure each element assumes its precise function by being different from the others; this is the principle of distribution that alone governs the function of the elements of language at its different levels, … (p. 139)

And concerning the ‘signified’:

> The second network, that of the signified, is the diachronic set of the concretely pronounced discourses, which reacts historically on the first, just as the structure of the first governs the pathways of the second. (p. 139)

Lacan notes that the dominant factor here is the unity of signification, which proves never to be resolved into a pure indication of the real, but always refers back to another signification. As such the signification is realized only on the basis of a grasp

of things in their totality – only the signifier guarantees the theoretical coherence of the whole as a whole. Lacan (1973/1979) asserts that everything emerges from the structure of the signifier. The signifier, producing itself in the field of the Other, makes manifest the subject of its signification. According to Lacan the subject is that which is represented by the signifier, and the signifier can only represent something for another signifier (Benvenuto & Kennedy, 1986). Whence it is deduced that the signifier represents the subject (as opposed to the Other) for another signifier (Lacan). Consequently Lacan contends that the subject ought to be sought in the very structure of the signification chain (sentences, paragraphs, in speech), or indeed, that the subject is this very chain. The subject is propelled forward along the chain of which it is part, as the signifiers (by which it is constituted) slide away from the signified, from the 'something'. To quote Lacan (1973/1979):

> But it [the signifier] functions as a signifier only to reduce the subject in question to being no more than a signifier, to petrify the subject in the same movement in which it calls the subject to function, to speak, as subject. (p. 207)

Lacan thus enunciates two definite processes involved in the fabrication of a fundamental 'lack of being' – firstly the lack of being engendered by the subject's alienation in the Other (mirror stage), and secondly a lack resulting from the fact that the subject depends on the signifier, and that the signifier is first of all in the field of the Other.

To conclude the exposition of applicable Lacanian theory, the author will further inform the perspective of the reader by briefly examining what Lacan (1966/2001, p. 214) designated the L-schema (see Figure 1).

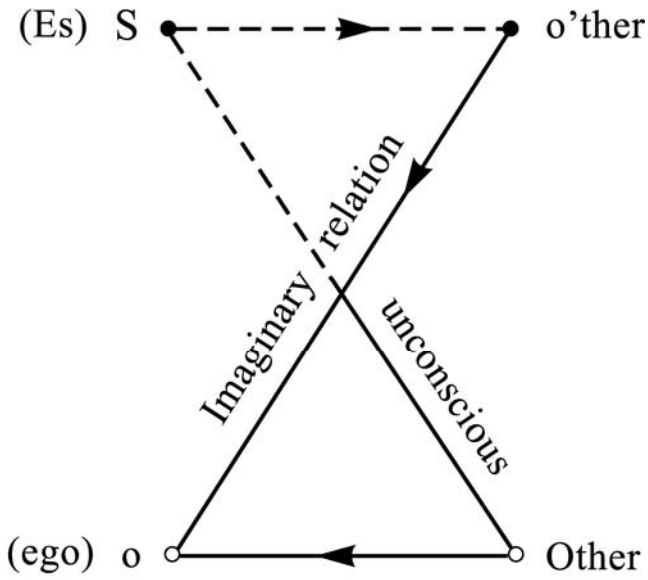


Figure 1. L-schema

Lacan asserts that this schema signifies that the condition of the subject (neurosis or psychosis) is dependent on what is being unfolded in the Other. He describes it as follows (Lacan, 1966/2001):

> … he [the subject] is stretched out over the four corners of the schema: namely, S, his ineffable, stupid existence, o', his objects, o, his ego, that which is reflected of his form in his objects, and O, the locus from which the question of his existence may be presented to him. (p. 214)

Note that there are two planes represented here – the Imaginary and Symbolic planes. Benvenuto and Kennedy (1986) writes that the Imaginary plane is represented between o and o', the relationship between the ego and its mirror image, the ego's imaginary counterpart, through which the subject is alienated. The small other (o') can be any other subject in the role of observer or interlocutor. Although o' is the place from which a given other speaks, the other's locus is immanent and inherent in the quadrature of subjectivity. Lang (1995) states that the other is a place from which any ego projects the ideals (and all the shadings of love and hate) that have been introjected to constitute the ego in the first place. It is the gaze of others (approving, guilt-inducing) which trigger unconscious ego affects (the diagonal vector from top

right to bottom left) and prompt the articulation of the latter's self-justification, anger, grandiosity, or any other such Imaginary 'affect' that rigidly resists knowledge of its desire.

The Symbolic plane is represented between S and O. The letter S refers to the analytic subject, not the subject in his/her totality, but in the person's opening up towards his/her own truth when he/she comes to analysis and begins to speak. The O is the absolute Other to whom the subject's truth is addressed (Lacan called this kind of speech 'full speech'- the analysand's true speech addressed to the Other), or who can nullify the subject. Lacan describes the relation of the subject to the Other as "circular and dissymmetrical, yet without reciprocity" (Lacan, 1973/1979, p. 207). Between S and O the symbolic realization of the subject takes place unconsciously. The relation between o – o' (the imaginary relation) forms an obstacle to the subject's symbolic realization. Benvenuto and Kennedy (1986) elaborates on this point and writes that what passes between S and O, for instance in the insistence of the signifying chain, always passes through the mediation of the imaginary relationship o – o'. When the subject speaks in analysis, aiming towards the realization of the true subject (when he goes from S to O), he/she is diverted into o – o'. As such the truth always remains elusive and the subject is constantly drawn to the four corners of the scheme. This counteractive dynamic between the Other and the Other is basic to the structure of the subject.

In the following section the supposition of locality, hitherto implicitly accepted as primary to psycho-physiological experience (as postulated by the current study), will be explicated by demonstrating the immanent presence there-of in Lacanian theory. In the process a more succinct understanding of the premise of non-locality will be facilitated.

3. 2 The premise of locality in Lacan

The premise of locality is what you might call 'common sense'. It is a rational supposition that reminds of the geocentric universe (as discussed earlier), which was considered a logical necessity up until the 17th century. The author asserts that this

notion of locality has been a fundamental supposition implicit in much of historical and contemporary scientific, psychological and philosophical thought. The author will first describe a few factors indicative of the premise of locality before an instructive case study will be made of Lacanian thinking to demonstrate this supposition.

In enumerated format the indicative factors are the following:

1) A fundamental or exclusive here-there/now-then dichotomy. Demonstrative of this idea is the basic subject–object distinction, the acceptance of the observer-observed system as being endowed with some sense of ontological status. Also the perception of exclusively opposing/differentiated subject positions, be it a person as a subject here on toward a person as a subject there, or the self as a subject now and the self as a subject later. The logic inherent to the linguistic system is emblematic of the subject-object locality assumption. The idea that distinct objects are signified with particular signifiers, and that the interactive states of these signified objects can be described by the use of verbs – expresses the rudiments of the basic subject-object distinction (example: the boy kicks the ball) or the subject-predicate differentiation (example: I decided what to do – 'decided what to do' representing the predicate). If language is accepted as an encompassing and base form of logic, the premise of locality is supposed.

   Regarding the now-then dichotomy, the attribution of any form of temporal exclusivity to experience, reflects a locality supposition. The accepted inter-relatedness of 'here-there' and 'now-then' in this study is based on Einstein's notion of the space-time continuum (formulated in Capra, 1999).
2) The instance where the biological body is considered to be the base of being, the encompassing locus of experience.
3) A sense of experience delimited and restricted to localized perception.
4) This factor represents an extrapolation from factor 2: A decentred state of cognitive interpretation rooted in an original medial position.
5) To accept rationality, as will be defined later, as prototypical or fundamental to existence - as such establishing irrationality and its pathological demeanour. Is it not clear that the irrational, through its signifier function, assumes sensibility by the agreement of the rational? The irrational always bumps

heads with the rational, but importantly – first there was the bump, then there was the opposition (rational vs. irrational). To be sure, the premise of **non**-locality can be considered a signification not of a kind of *pre-rationality*, but rather the signification of a *per-rationality*[2], or specifically coined otherwise – the intuitive-element (will be explicated in section 4.5). This thesis does not emanate from rationality, rationality is implemented through its conditioned signification function (as such configuring its delimitation) to express the 'movement' of locality, thus rendering the rational and the irrational different sides of the same intuitive coin, or formulated otherwise – the rational and the irrational are mutually constructing significations signifying its own per-rational beginning and end. It is through the intuitive-element that the author produces the rationality now interacting with the reader, expressed by way of localized language. Language itself will be used to contradict its own subject-object configuration (section 4.5). This will, however, only be problematic if a premise of locality is assumed (as will be discussed). In this way the author's use of language does not fall into the trap of positing a premise of non-locality while implicitly assuming a premise of locality. Through the intuitive-element (later designated 'non-local perceptum') the local and the non-local are experientially united – these two dichotomous concepts also only taking shape after the bump. In the case at hand, the bump assumed the form of the pertinent quantum physics experiments.

6) Professing the 'I' to be central and/or causative. The notion that there is some type of central and independent state of self, causing action or thought or rationality, and so forth. See Libet's experimental results (discussed in section 4.1), which fundamentally question the validity of a 'causative I' or a 'causative local consciousness' – even if a premise of locality is assumed.
7) Positing a mind-body duality. A fallacious presumption embarrassed by the intuitive-element. Assuming any duality to be ontological reifies conditioned rationality as original and culminates in the premise of locality.
8) Attributing relational primacy to *physical* interactions (physics) and/or psychological interactions (psychology) without acknowledging the principle

[2] Per is Latin for 'through': per-rationality refers to that which permeates localized movement and localized thought, that which goes through what is rational. Will be conceptualized in terms of the intuitive-element.

of symmetry in terms of non-locality (the idea of symmetry in context of this thesis is defined as the phenomenon that certain aspects remain invariant during a given process or procedure, or alternatively, the occurrence that certain features remain the same while other features change – the symmetrical [R]). The principle of symmetry in the form of the symmetrical [I] is central to the hypothesis of non-locality and will be explicated in detail in section 6. This factor is strongly related to factor one.

The nihilistic nature of Lacan's thought is due to the miscellaneous forms the locality supposition adopts in his theory. The author will now formulate a compendious exposition of the assumption of locality simmering beneath the surface of this complex theory.

Making reference to the myth of Narcissus (Meyer et al., 1997), the man who quite literally fell in love with his own mirror image reflected in the water, Lacan explains how the infant tries to discover himself or herself in the image of the other – for example in the voice or facial expressions of the mother. Similar to the way the surface of the water acted as a mirror for Narcissus, so the other acts as a mirror for the infant - a mirror image with which the infant falls in love with and in a sense adopts as his own. Lacan explains that this primitive identification/projection forever alienates the infant from his or her own true subject position. Lacan (1966/2001) writes, "…and, lastly, to the assumption of the armour of an alienating identity, which will mark with its rigid structure the subject's entire mental development" (p. 5). This 'assumption of the armour of an alienating identity' aptly demonstrates the assumption of locality in terms of factor 1 and factor 4 (as enumerated above). Lacan holds that this alienation will form the foundation of the rest of the infant's psychological development, and as such he acknowledges the just mentioned locality indicators - if there is a sense of decentralized alienation, by implication there must be some central departure point (locality) whence such alienation could occur. Concerning this implied central departure point we find substantiation for this in a discussion of Lacan by MacCannell (1986), "The Symbolic replaces the indexical topography of the body with the iconic imagery of geometry, the graph, the number, etc. Images displace, replace, the body, *but their provenance is from the body*…" (p. 8).

Here the author (of this thesis) is also alluding to factor 2. If the body is posited as an original state of being, locality is assumed as premise. A premise of non-locality, through necessity of the very logic by which it is constituted, intimates that every bodily form assumes an epiphenomenal dynamic in relation towards every other bodily form. Semantically expositioned, the latter refers (in terms of non-locality) not only to a 'link between bodies' or exclusive dichotomous inter-relations, but also to the 'link of bodies' or 'intra-relation' – the latter proposition will be explicated in detail in later sections.

Furthermore, Lacan's conceptualization of a 'lack of being' depends primarily on the subject being alienated in the Other during the mirror-stage. The central importance of the Other in relation to the subject is conveyed in Lacan's (1979) following descriptions, "The condition of the subject is dependent on what is being unfolded in the place of the Other (p. 203), and, "The Other is the locus in which is situated the chain of the signifier that governs whatever may be made present of the subject – it is the field of that living being in which the subject has to appear" (p. 193).

Thus it should be clear that the Other forms a focal point for all perceptual experiences concerning human cognition. In fact, what Lacan essentially describes is the substitution of one centre for another – the Other for the individual's own body (alternatively the Other for the ego). Accordingly, it might be said that a new centre has been established that can be understood as decentralised only from the original frame of reference on which its formulation is dependent, or described otherwise, accepting two differential positions, the subject on toward the Other - from the perspective of the other position (note – not Other, but the 'other one') each position can be regarded as decentralized or alienated as to certain executive functions. Thus factor 1, factor 2 and factor 4 are indicated.

Even if the Other were to be formulated in circular terms to express the signification function of a signifier, it must analogously be remembered that strictly speaking, the Copernican heliocentric universe was not sun-centred! In order to account for the observation of the sun Copernicus used three circles to describe the motion of the earth: one for the earth, one for the central point of the earth's orbit, and one for

another central point for the circle of the central point of the earth's orbit. The central point for the circle of the earth's central point in turn revolved around the sun (Pine, 1988). Through these deferents and epicycles even the circular Other becomes caught in centring. A dynamic centre placed on the rim of a revolving circle/sphere is a centre nonetheless.

The fundamental and ultimately alienating pre-eminence Lacan ascribes to the language function is further indicative of the premise of locality (see factor 1). The prototypical importance Lacan attaches to language in terms of the subject-object logic (here-there logic) can readily be gleaned from the discussion in section 3.1; his emphasis on language formed the foundation of his critique directed towards the psycho-analytic establishment for ignoring the nature and functions of the symbolic order, specifically the function of language (Lacan, 1966/2001).

From the above it should be clear that the supposition of locality can assume multifarious forms, and is not by any means encompassed by the central 'I' assumption (related to factor 6). In this category of the locality assumption the author pre-emptively postulates that all of the following schools of psychology can readily be placed: depth psychological approaches, behavioural and learning theory approaches and person orientated approaches. In all of these approaches the author expects at least one of the factors enumerated above to be surreptitiously camouflaged or explicitly expounded. Consider for example Freudian theory. Freud radically undermined the lofty perch on which man had placed the rational self-image, with his revelation that below or beyond the rational mind existed an overwhelmingly potent repository of non-rational forces (the id). So already with Freud we find the idea that the sense of self (the ego) is a frail and fragile epiphenomenon constituted by a convolution of reaction formations and delusions, the notion that the ego is not a primary state of being but an illusory derivative (correlate with factor 6). Thus Freud substituted the conscious human ego with a seething caldron of irrational, bestial impulses – postulating an unconscious state of determination. As such the ego was dethroned, but the newly inaugurated unconscious forces still accepted their provenance from the biological body with its long phylogenetic tail. Psycho-dynamic

theory injected fresh content into the locality supposition, but remained firmly rooted in the arid soil of the locality premise (see factor 2).

Whether it is called the ego, the ideal self, organismic potential, the existential self, the unconscious or the self-concept, the domain of psychology is rife with the assumption of locality. These multifarious conceptualizations represent out-trodden variations of an ancient Ptolemic theme, or described otherwise, forever fumbling differentiations of a geocentric universe supposition. These variations and differentiations are conjoined by an assumption thread that accepts the following antonomasia – 'locality centric psychology'.

'Locality centric psychology' is ignorant of *its* own ignorance – *she* aspires the dictum: 'I don't know that I don't know'. For the one who assumes locality as exclusive or original, desperately and frightfully clings to rational 'knowing', clutches at the objectifications (will be explicated in section 4.4) that allow *him* the existence as subject – even if this subject position impersonates the religious sheep form, moreover, especially the bloody kind.
Alternatively, if such a one has not learnt to cling well, or if the required grasp exceeds *his* reach, the conglomeration of rationality and emotionality has been kind enough to lend *her* its own form of subject – *he* now becomes designated neurotic, psychotic or, if one could imagine – mad.

The Galilean telescope has come back to haunt us, and it has assumed the form of quantum physics. The quantum telescope does not magnify distant localities, rather it penetrates the mirage of locality. This telescope is the harbinger of non-locality.
Our journey has now reached the fringes of the flat earth.

Section 4

4. Non-local perceptum

4. 1 The physiology of locality

Accepting non-locality as premise reconfigures traditional perspectives concerning rationality and emotion, consequently unveiling the pre-eminence of a hitherto mere fascination of the western mind – the intuitive-element. In this section the author will examine the character of this reconfiguration and the physiological plinth that supports the distinction between what will be designated the rational-element (abbreviated – [R]-element) and the emotional-element ([E]-element); through this explication alluding to the sine qua non of the intuitive-element ([I]-element).

The author posits that the movement of localized form informs the possibility of rationality. Localized patterns characterize the dynamic mechanisms of biological matter (interacting proteins and biochemicals) that allow the notion of rationality to be conceptualized (the organic brain), indeed, the very suffusion that organizes any conceptualization. These patterns of 'movement', often unnecessarily translated as *causative* interactions, provide the 'common sense' framework for interpretive and communicative experience. Consider the following instructive elaboration in point.

An infant interacts with the environment. Say the infant stretches out his/her hand in an attempt to grasp a ball, his/her hand bumps the ball and the ball slowly rolls in the direction of the force applied by the infant's arm-hand. The ball continues to roll until it comes to rest against a wall – the wall prevents the ball from rolling any further. Thus the essential pith of what is rational becomes established. This basic sequence of events, or any other similar interaction patterns, represents the rudiments of localized movement conditioning, it forms the basis of what the matured healthy cognition will accept as logical. From this primitive experience, more elaborative patterns of rationality develop – for example: a bowler bowls a ball at a batsman, the ball swings in the air as a consequence of air resistance being greater on the rough side of the ball, the ball hits a crack in the pitch, thus deviating from its expected swinging course – causing the batsman to miss the ball with his bat, which allows the

ball to hit the stumps – the force of the momentum uprooting two of the stumps. All this action is then translated into a logical game format expressed in terms of agreed number and letter signification. Ultimately rendering the concepts winner and loser rational in their implied meaning.

But our rationality, contingent upon the movement of locality, might have been very different. The infant might have bumped the ball, but instead of the ball rolling in the direction of the bump-force, the ball might have moved vertically into the air, eventually hitting the ceiling, but moving through the ceiling because physical objects sometimes moves through other physical objects (in this other 'might have been' reality). Or in terms of the cricket example – it might have been impossible for bowled balls to move in any other way except in a straight line, because air resistance only allowed bowled balls to move in a straight line. It might have been impossible for any batsman to miss a ball, rather it would have been a question of how inaccurate the batsman could hit the ball into the ground, and as spectators we would enjoy watching such artistry because seeing balls being hit inaccurately into the ground is experienced as fun.

It was Newton's observation of the movement of localities that provided the guideline for his formulation of the three laws of motion. Consider Newton's first law of motion – every body continues in its state of rest or of uniform speed in a straight line unless it is compelled to change that state by a net force acting on it; and his third law of motion – whenever one object exerts a force on a second object, the second exerts an equal and opposite force on the first. But what if the physical universe Newton observed behaved in a different fashion? What if Newton had bumped the ball when he was a baby and the ball just kept on accelerating without little Newton continuing to bump the ball? What if Newton had picked up an apple and the apple's weight kept on increasing the longer Newton held the apple in his hand? It would be reasonable to expect that Newton would have formulated his laws of motion in a very different manner. For example, the first law of motion might have read as follows: every body continues in its state of accelerated speed in a straight line with only certain forces capable of decelerating the moving body; and the third law of motion: whenever one object exerts a force on a second object, the second exerts an exponentially increasing and opposite force on the first.

The point is the following: Our sensory experience of the moving world might have been very different, we might not even have had such a thing as sensory experience or movement of separate bodies! As it is, the way we have experienced the world, or - experienced our experience, has laid down a matrix of expectations that imbue our sense of rationality, or more precisely, construct something such as rationality with all its pattern and principle configurations. Rationality is a function of the movement of locality, hence the [R]-element.

The pattern of the [R]-element is constructive and pervasive. Consider the following: the double-helix DNA structure appears to be fundamental to most living organisms, moreover, genes (and their constitutive nucleic acids) seem to be the basic building blocks of all life. There exists a great deal of similarity in brain organization across the various vertebrate species. All vertebrates have a hindbrain, midbrain, and forebrain, and within each of the three divisions, one finds the same basic structures and neural pathways (Shepherd, 1983). The great diversity of life in the physical universe is typified by certain common biological adaptive mechanisms– many organisms posses a basic respiratory system, be it of a terrestrial or aquatic character, most living organisms posses evolved biological mechanisms which allow for the uptake and excretion of some form of nutrient; also in order for life to proliferate, biological species have developed reproductive systems ranging on a continuum from very basic to extremely complex. The author will now investigate the Homo sapiens brain, during which the [R]-element and the [E]-element will be succinctly differentiated as to their physiological provenance.

Over millions of years of evolution, the mammalian brain grew from the bottom up, with its higher centres developing as elaborations of lower, more ancient parts; the evolutionary course of the developing brain can roughly be retraced in the human embryo (Goleman, 1996). At the apex of the spinal cord we find the brain stem, the most primitive part of the brain. This root brain regulates basic life functions like breathing and the metabolism of the body's organs, as well as controlling stereotyped reactions and movements. From this primitive root developed the limbic system, constituting the essential (but not encompassing) layers of the emotion-related brain (Goleman, 1996). Key limbic structures are the amygdala (of which there are two)

and the hippocampus. The hippocampus is involved in registering perceptual patterns and provides a keen memory for context, which is vital for emotional meaning. The amygdala is the specialist structure for emotional matters, functioning mainly to attribute emotional significance to events. Joseph (1993) describes the case of young man whose amygdala had been surgically removed to control severe seizures. After the operation he became completely uninterested in people and distanced himself from those around him. He was perfectly capable of conversation, yet he was no longer able to recognize close friends, relatives, or even his mother. When his friends and family became upset about his indifference, he remained apathetic and emotionally blunt in the face of their anguish. He seemed to have lost all recognition of feeling, as well as any feeling about feelings. Accordingly the amygdala appears to play a central role in the human experience of the [E]-element.

From the limbic system evolved the neocortex, the great bulb of convoluted tissues that make up the top layers of the brain. The neocortex, the seat of thought, contains the centres that put together and comprehend what the senses perceive (Goleman, 1996). The neocortex allows us to think about feeling and is the facilitator of art, civilization and culture. As such the neocortex can be considered a major ingredient of the anthropomorphized [R]-element, the biological occurrence that allows for the formulation of the rational.

Essential to the understanding of localized [E]- and [R]-perception, and objectification (will be explicated in section 4.2), are the structural brain dynamics involved in stimuli processing. Concerning conscious action and explicit memory, the following neural pathway is involved. The eye, ear, and other sensory organs transmit signals to the thalamus (a type of relay centre), which are then relayed to the sensory processing areas of the neocortex, where they are synthesized into the objects we perceive. These representations are then shuttled to the surrounding cortical regions, which, in turn send further processed representations to the limbic system, specifically the amygdala and the hippocampus. In this system the amygdala is functional in orchestrating a response (due to its 'emotional' impetus), while the hippocampus is essentially involved in memory formation. The hippocampus communicates back with the surrounding cortical areas, which communicate with the neocortex (LeDoux, 1996). This pathway where the hippocampus is central, is

constitutive of explicit (declarative) memory and is mediated by a single memory system – the temporal lobe memory-system (Graff, Squire & Mandler, 1984). The maintenance of the memory over the short term (a few years), requires that the temporal lobe memory-system be intact, either because components of this system store the memory trace or because the trace is maintained by the interactions between the temporal lobe system and the neocortex.

With regards to implicit memory and unconscious action, LeDoux (1993) discovered a smaller bundle of neurons that lead directly from the thalamus to the amygdala (in addition to those going through the larger path of neurons to the neocortex). As such the amygdala can receive direct signals from the senses and start a response before they are fully registered by the neocortex. According to LeDoux the amygdala system can act independently of the neocortex – the latter was demonstrated with an experiment on rats. According to LeDoux (1996), the direct thalamo-amygdala path is a shorter and thus faster transmission route than the pathway from the thalamus through the cortex to the amygdala. The direct pathway allows the organism to begin to respond to potentially dangerous stimuli before it is consciously aware of the pertinence of the stimuli; as such obvious survival advantages are conferred to the organism. This pathway represents the origins of a typical fear conditioned response exemplified by the following: racing heart, taut stomach, high blood pressure, clammy hands and feet, and dry mouth (LeDoux).

In traumatic situations, implicit and explicit memory-systems (the two different pathways discussed above), function in parallel. If a person is exposed at some later stage to stimuli that were present during the trauma, both systems will most likely be activated. Through the explicit memory-system (the hippocampal-system) the person will remember what he/she was doing, who he/she was with during the trauma, and will also remember the impersonal fact that the situation was unpleasant. Through the implicit memory system (the amygdala-system), the stimuli will cause the person's muscles to tense up, blood pressure and heart rate to change, and hormones to be released, among other bodily responses. Because these systems can be activated by the same stimuli and function at the same time, these two memory functions can be considered to be part of one unified memory function (LeDoux, 1996).

From the above discussion it appears that the [R]-element, closely linked to the movement of locality, accepts an amalgamated relation to the [E]-element through their mutual biological substrate (the brain) and shared neurological circuitry, whence their conception and experience emanate. How is the reader to understand the author's notion of 'an amalgamated relation'? Beyond a nice formulation, how would one dissect its meaning as to a premise of non-locality?

Tooby and Cosmides (1990) argue that emotions involve situations that have occurred over and over throughout human evolutionary history (escaping from danger, finding food and mates), and cause humans to appraise present events in terms of their ancestral past - so the structure of the past imposes an interpretive landscape on the present. From such a line of argumentation, the pivotal role of the conditioning dynamics of the movement of locality as to emotion can readily be gleaned. LeDoux (1996) describes emotions as follows, "… I believe the basic building blocks of emotions are neural systems that mediate behavioural interactions with the environment, particularly behaviours that take care of fundamental problems of survival (ex – protection from danger, finding food)" (p. 125).

Thus a very primitive base for emotional genesis is implied, and from this interpretation it can be logically deduced that the myriad forms of emotional expression/response is in some definite sense associated with the development of the higher areas of the brain (example– the neocortex). Goleman (1996) writes:

> As we proceed up the phylogenetic scale from reptile to rhesus to human, the sheer mass of the neocortex increases; with that increase comes a geometric rise in the interconnections in the brain circuitry. The larger the number of such connections, the greater the range of possible responses. The neocortex allows for the subtlety and complexity of emotional life, … (p. 11)

Damasio (1994) made careful studies of the precise cognitive functions that are impaired in patients with damage to the prefrontal–amygdala circuit (part of the hippocampul-system). The prefrontal lobes form part of the neocortex and appear to be nucleic to all emotional experience and interpretation. The experimental results showed these patient's decision-making skills to be terribly flawed, yet they exhibited

no deterioration in IQ or any cognitive ability. Despite their intact intelligence, they made disastrous choices in their business and personal lives; and according to Damasio they could obsess endlessly over decisions so simple as when to make an appointment. As such it seems evident that inside the physiological brain the emotional circuitry is dynamically involved in the rational circuitry in terms of every day decision-making capabilities. These two circuits are in some sense anatomically and physiologically distinguishable, yet are in a very definite sense intricately intertwined. Thus the author's notion of 'an amalgamated relation' is to be understood for the formulation of the [R]-element and the [E]-element.

If the premise of locality had been assumed, the biological body would readily be posited as the root base that becomes conditioned, the rubicon of experience that can never look past its own subjective conditioning, always challenging its conditioning from within its conditioning and through its conditioning. As such presumptuously relegating experience to the deprived existence of basic social constructionism tenets.

From the premise of non-locality one is confronted by a very different provenance of rationality and emotion. A provenance of [R]-element and [E]-element that proclaims all rubicon and Archimedean points illusory projections of ignorant ignorance. The author is referring to the postulate of the [I]-element. This [I]-element will be elucidated in the following two sections.

But before the author proceeds with this elucidation, an important brain physiology experiment performed by Benjamin Libet needs to be expositioned for consideration in terms of the premise of locality (specifically certain assumptions of locality that are rendered problematic by Libet's experimental results).

Libet, Wright and Gleason (1982) investigated the 'Bereitschafts' – (BP) or 'readiness' – potential (RP), this is a schalp-recorded potential change that starts up to a second or more before a self-paced motor act (Gilden, Vaughan, & Costa, 1966). This 'readiness-potential' appeared to provide an electrophysiological indicator of neural activity that specifically precedes and may initiate freely voluntary movement (thus implying that voluntary movement is not so voluntary). Plainly stated, they investigated what might be called 'free will'; to what extend does the 'conscious I'

determine his/her own actions or decisions. Is the rational 'I' causative, or is it in some neurological sense 'caused'? The study investigated 'readiness-potentials' (RP) under conditions designed to minimize or eliminate all external factors (example – time limit) that might affect the immediate initiation of a freely voluntary motor act. The analysis included comparative experiments involving 'self-initiated' voluntary acts, 'pre-set' motor acts, and 'skin stimuli at unknown times'. The results were astounding.

In the series with 'skin stimuli at unknown times', preparation to move was eliminated, but all other conditions, including those of changes in processes associated with attention and cognition, were as similar as possible to those in the self-initiated voluntary acts series. The results for the 'skin stimuli' series indicated no or relatively small event-preceding slow potential shifts. This was in clear contrast to the 'pre-set' and 'self-initiated' series, where the 'RPs', generated by neuronal processes specifically involved in the preparation to perform a motor act, preceded the pre-set *and* free voluntary act. Libet et al. (1982) states:

> There would seem to be no doubt that an 'RP' can precede a 'freely voluntary' (endogenous) act, one that is essentially free of the external constraints in the usual 'self-paced' studies, and is independently 'self-initiated' and even spontaneously capricious in origin. (p. 331)

From Libet's experimental results the dubiousness of assuming the [R]-element conditioned 'I' as original to primary being becomes evident (see factor 6 in section 3.2). By imposing on the logic of subject-object ontological status and personifying causality in the form of the rational 'I', we are entangling ourselves in a glutinous web of locality. The latter experiment does not evidence non-locality, instead it questions central locality tenets – tenets that bespeak a servile abyss of repetitive circles, exemplified by the monotonous history of mankind suffocating amidst thematic boredom.

4. 2 Birth and the mirror experience

The uneasiness and motor unco-ordination of the neo-natal months is formulated by Lacan (1966/2001) as 'a real *specific prematurity* of birth in man' (p. 5). It appears that the infant has no proper sense of being separate from the world or the mother, and certainly no clearly identifiable self-reflective state of cognition. Burr (1995) writes that all sensation and experience originally appear as a complete whole for the infant, who is still bound up in a symbiotic relationship with the mother, lacking a fundamental sense of being separate from her. Or as Marini (1992) puts it, the child has only a very slowly dawning sense of distinction between the world, others, and the self. This notion of undifferentiated infantile experiences is suggestively supported by brain anatomical studies, which indicate that certain brain structures, particularly the hippocampus (crucial for narrative memories) and the neocortex (seat of rational thought), are not fully formed at birth and developmentally lag behind in relation to the amygdala, which reaches maturity very quickly in the neonatal brain (Goleman, 1996; Rudy & Morledge, 1994). Furthermore, the phenomenon of 'transvitism', where the child strikes another and says he has been struck, or cries when he sees another child fall (Goleman, 1996; Lacan, 1966/2001), can be considered to reveal the symptoms of an undifferentiated infant world.

The undifferentiated experience of the flailing infant beautifully correlates (importantly - does not 'equate') with the basic character of non-locality. Non-locality purports no exclusive experience of subject-object, no prototypical different or opposing subject forms, rather non-locality includes a Subject – Subject (S – S) state of being, simultaneously differentiated and undifferentiated states of localized being. S – S is instantaneously here and there, perfectly self and other – an essential infraction of conceptual space-time. For clarity purposes one might syntactically say that the differentiated body of the infant experiences the world in an undifferentiated fashion, whereas undifferentiated being experiences differentiated form. Logically formulated, S – S represents rational irrationality or irrational rationality, which by its very formulation might perfectly well be described as illogical. The logic of S – S will be explicated in section 4.5 where the nature of the associated intuitive-element will be discussed. In the subsequent disquisition the dynamics of the process of

objectification will be investigated. By objectification the author is referring to the cognitive capability clearly evinced by the human species - the ability to recognize the self in the mirror, awareness of the self as ephemeral and distinct subject, the cognitive capacity that allows for the formulation of 'observer-observed' or 'participator' terminology, the unambiguous possibility of self-reflective states. Human objectification will be correlated with animal cognition (insofar as we interpret animal behaviour in controlled research studies and assume that animals experience some form of experience) to determine perceptive/cognitive similarities and differences that through comparison draws a more vivid picture of both.

Objectification implies the synchronous emergence of self-awareness and other-awareness. This is a point supported by Gopnik and Meltzoff (1994) who argue that neither self- or other-awareness precedes the other, but rather that the two forms of awareness develop in tandem through the same mechanisms. The idea of developmental parallelism as opposed to the developmental derivation of the concept of other from that of self, or vice versa, is also consistent with Lewis's (1994) discussion of the self-socializing role of self-evaluative emotions (e.g., shame and pride) that emerge coincident with the first internalisation of social standards. Empirical evidence that supports the notion of a synchronous emergence of self- and other-awareness rests on cross-sectional findings of a consistency between a) mirror self-recognition as an *indication of self-awareness*, and b) self-conscious behaviour when in the centre of other's attention (Lewis, Sullivan, Stanger & Weiss, 1989), empathic behaviour directed toward a victim of distress (Bischof-Köhler cited in Asendorph, Warkentin & Baudonniére, 1996; Bischof-Köhler, 1991), and communicating with unfamiliar peers via the synchronic imitation (will be explicated later in this section) of their object use (Asendorph & Baudonniére, 1993), as *indications of other-awareness*. These consistencies were found for the age of 18 –20 months when about half of the children of a normal sample can be shown to recognize themselves in a mirror (Asendorph et al., 1996). Furthermore, Kagan (1981) describes a dramatic increase in a child's social-cognitive competence during the second year of life, and according to Kagan these changes are indicative of the onset of self-awareness *and* other-awareness.

The developmental formulation of objectification as a dyadic phenomenon, is an idea espoused by various prominent theorists of the 20th century, for example: Vygotsky's (1962) notion of 'intermental', Fairburn's (1954) of the infant's innate interpersonal relatedness, and MacMurray's (1961) of the field of the personal, as well as Sullivan's (1953) of the interpersonal field.

Thus, through the process of objectification, the infant becomes aware of himself/herself as a subject in tandem with becoming aware of other people as distinct and separate subjects. As such S – S becomes differentiated as to the perception and conceptualization (in the case of the matured and healthy *human* cognition) of distinct and separate subject positions, which can be encoded into the basic form of S – S: O, formulated in words as 'dichotomous subject objectification' (any localized form represents a differentiation of S – S, here the discussion is specifically concerned with localized differentiation through human cognition). This process of objectification during infancy is illustrated in diagram form below (diagram developed by the author):

Figure 2. Perception structure

Subsequently the author will explore the specific psychological mechanisms that might be involved in this process of objectification. To this end the author will examine the research domain of mirror self-recognition, which has received much attention as a possible index of self-awareness, self-consciousness, and social development in humans and infrahumans (Damon & Hart, 1982; Lewis & Brooks-

Gunn, 1979, 1984) and is the only widely accepted assessment paradigm in the study of the infant's sense of self (Damon & Hart, 1992).

Research indicates that normal children self-recognize by 18 months of age on average (Hart & Fegley, 1994; Lewis & Brooks-Gunn, 1979; Neuman & Hill, 1976). Other than the great apes (primarily common chimpanzees and orangutans), non-human primates have not demonstrated unequivocal evidence of mirror self-recognition (Anderson, 1984; Gallup, 1991; Parker, Mitchell & Boccia, 1994). Various theoretical models have been developed to explain mirror self-recognition, for example: Gallup's self-concept theory, Guillaume's and Mitchell's inductive theory, Parker's facial imitation theory, Merleau-ponty's, Anderson's, and Loveland's perspective-taking theory, and Byrne's possible world's theory (Mitchell, 1993b). According to Mitchell (1997a), most of these theories appear to be reducible to two theories – Gallup's self-awareness (self-concept) theory (designated Gallup's theory), and the kinaesthetic-visual matching theory (designated KVM-theory) – or make predictions that are contrary to evidence. Hence the author will commence the objectification explication using these two theories as platform.

Gallup's (Gallup, 1985; Gallup & Povinelli, 1993) theory holds that an organism's self-awareness is an explanation for passing the 'mark test' (used as index for mirror self-recognition). The theory assumes that passing the mark test is an indication of self-recognition and that self-recognition is an indication that the organism can become the object of its own attention and is therefore self-aware. Gallup extrapolates form this basic self-awareness to explain a variety of other psychological capacities, including amongst others – theory of mind, empathy and pretending. In Gallup's view, organisms that are self-aware are aware of their own mental states, and model conspecifics' mental states on the basis of their own mental states. In section 4.3 Gallup's theory will be related to Lacan's description of the infant's experience of the mirror.

The KVM-theory (as expositioned in Mitchell, 1997b) was initially formulated by Guillaume (1926/1971) and elaborated by Parker (1991) and Mitchell (1992, 1993a, 1993b) – this theory claims that passing the mark test is a result of kinaesthetic-visual matching - defined as the capacity for matching between the kinaesthetic,

proprioceptive, and somasthetic sensations of one's own position and one's own bodily feeling, and visual images of one's own body and others' bodies. According to Mitchell (1997a) kinaesthetic-visual matching would seem to provide the capabilities for activities (in addition to bodily imitation and mirror self-recognition) which require matching between self and others, such as bodily pretense, recognition that one is being imitated, and planning; and appears to be a necessary ingredient for intentional (planned) deception, empathy, and perspective taking. An organism with kinaesthetic-visual matching can not only reproduce other's actions in pretense, but also presumably can translate from its own visual mental images of itself into action in planning, and from another's actions to its own similar actions to recognize that it is being imitated.

Mitchell (1997b) analysed the two theories and stated that:

> …the kinaesthetic-visual matching model is conceptually coherent and makes accurate and reasonable predictions; and that the self-concept model (Gallup's theory) is conceptually incoherent and makes predictions from premises that are inaccurate. (p. 18)

In this analysis Mitchell identifies three problems with Gallup's theory: a) Gallup identifies the self-awareness necessary for mirror self-recognition with any and all other forms of self-awareness, yet provides no evidence or argument that recognizing oneself in a mirror results in or requires being aware of one's own mental states b) Gallup's model expects that self-aware organisms extrapolate from their monitoring their own mental states to others' mental states, yet does not specify which mental states are monitored c) Gallup's model assumes that simply being self-aware (in the form of self-recognition) necessarily leads one to extrapolate from one's own mental states to understand other's mental states. Mitchell then discusses evidence which is at variance with the predictions of Gallup's theory, for example: chimpanzees who self-recognize fail to show signs of attribution of even the simplest mental states (e.g., seeing) and normal children generally pass the mark test well before they attribute mental states to others (Baron-Cohen, 1995; Parker et al., 1994; Povinelli & Eddy, 1996).

Mitchell (1997a) focuses his evaluation of the two theories on a little discussed group: autistic children. According to Mitchell autistic children present a good test case for the theories because they frequently pass the mark test and have been tested on measures of imitation (of various forms), recognition of being imitated, pretense (bodily and other), intentional deception, empathy, theory of mind, planning, perspective-taking, and theory of mind. Mitchell demonstrates through the predictions from the two theories and evidence of the predicted psychological concomitants in autistic children, that Gallup's theory is inaccurate and that the KVM-theory is accurate. Gallup's theory predictively attributed the psychological capabilities 'theory of mind', 'intentional deception', and 'empathy' to autistic children, thus being at odds with the empirical research findings. KVM-theory was consistent with research findings.

Mitchell (1993a, 1993b) writes that the KVM-theory is, of the two, the only theoretical viable one. Swartz (1997) holds that Gallup's requirement of 'self-awareness' for mirror self-recognition is an extreme and unwarranted position. She argues that mirror self-recognition does not imply a self-concept, and that it is not appropriate to treat it theoretically in the comparative domain (animals) as a necessary indicator of a sense of self. Furthermore, Gergeley (1997) also critiques Gallup's theory and states that the developmental synchrony prediction based on Gallup's model of mirror self-recognition does not hold.

The equivalence between kinaesthesis and vision for passing the mark test has been independently discussed in various but fundamentally related forms (cited by Mitchell, 1997b) in Priel (1985), Meltzoff (1993), Kennedy (1992) and Parker (1991). The notion that matching between kinaesthesis and vision is necessary for both mirror self-recognition *and* bodily imitation is discussed by Wallon (1954/1984). Kinaesthetic-visual matching is possible because the parietal region of the brain's left hemisphere houses visuokinaesthetic motor engrams, where motor acts may be programmed (Heilman, Rothi & Valenstein, 1982). These 'engrams' co-ordinate between one's own kinaesthetic experiences and visual experiences of oneself and others. Injuries to the left parietal region result in ideomotor apraxia in which people show impaired imitation of others' bodily gestures (Heilman, Rothi & Valenstein, 1982; Goldenberg, 1995). Taking the physiological brain dynamics and the basic

suppositions of KVM-theory into consideration, it follows as a logical deduction that one would expect a significant relation between mirror self-recognition and imitation abilities. And indeed, there is now clear evidence of a connection between having gestural imitation abilities and passing the mark test in normal functioning humans (Hart & Fegley, 1994) and in autistic children (Mitchell, 1997a). Corroboratively, several chimpanzees, an orangutang, a bonobo, and a gorilla tested for both bodily/gestural imitation and mirror self-recognition provide evidence for both capacities (Custance & Bard, 1994; Hyat and Hopkins, 1994; Miles, 1994; Patterson & Cohn, 1994).

The important factor in both mirror self-recognition and imitation is contingency, but the contingencies involved in the two processes differ in significant ways (Custance & Bard, 1994). In the case of mirror self-recognition the contingency is *recognized*, whereas with imitation the contingency is in a sense *produced*. When the infant cognition has matured to such a level where he/she has acquired both these capacities (normal children start recognizing that they are being imitated at 14 months [Meltzoff, 1990a]) the synthesis of these two processes allows for a kind of pre-verbal communicative interaction - the *synchronic imitation* of each other's object usage (Baudonniére, 1988; Eckerman, Davis & Didow, 1989; Eckerman & Stein, 1990; Nadel & Fontein, 1989). In synchronic imitation (Asendorph et al., 1996) two children simultaneously play with the same type of object in a similar, though not always identical way. They regularly look at the partner and seem to realize and enjoy the reciprocity inherent in their joint play, as indicated by the positive mood, and they often begin and end the object use at the same time or shift to a different activity almost synchronically. The reciprocity involved in the activity distinguishes synchronic imitation from simple immediate imitation (Baudonniére, Werebe, Michel, & Liégeois, 1988) and from parallel play - playing with similar toys near to the partner, with some visual regard of the partner but without clear indications of interaction (Mueller & Brenner, 1977; Parten, 1932).

Research conducted by Asendorph and Baudonniére (1993), investigated the relationship between mirror self-recognition and synchronic imitation. They systematically paired unfamiliar 19-month-old children in terms of their mirror self-recognition status and studied the extend to which they engaged in synchronic

imitation. Their results were as follows: unfamiliar 19-month-old children who passed the mirror self-recognition test became engaged in long phases of synchronic imitation if their partner was also a recognizer. In mixed dyads in which a recognizer and a non-recognizer were paired, fewer long imitation sequences resulted, and the average length of these sequences was shorter than in dyads in which both partners were recognizers. Dyads consisting only of non-recognizers showed only very few and short phases of synchronic imitation. Recognizers tended to initiate synchronic imitation more often than non-recognizers by inviting them to join play or by joining the play of the partner. The researchers thus concluded that mirror self-recognition is associated with sustained synchronic imitation as a form of pre-verbal communication with an unfamiliar peer and suggests that the association can be interpreted in terms of a synchrony between self- and other-awareness (thus further substantiating the S – S: O model). Using a different methodological approach, these results were replicated by Asendorph et al. (1996).

The ability to recognize contingency (mirror self-recognition), to produce contingency (imitation), and to partake in synchronic imitation, will conjunctively be designated – the phenomenon of symmetrical states. To further elucidate the phenomenon of symmetrical states, the author will comparatively investigate the anomaly exhibited by some organisms that demonstrate the ability of object correspondence (ability to locate objects using mirrors), yet do not recognize themselves in the mirror (Mitchell, 1993b).

Consider research conducted by Loveland (1984) concerning the development of linguistic self-reference in young children. Loveland observed nine children longitudinally in a mirror task. In the mirror task the child was first asked to name or identify the self-image, then to find a toy that the examiner introduced silently above and behind the child's shoulder. Children began the study at ages between 20 and 27 months and completed it when the criteria were met relating to language development. Many of the children who were able to identify themselves in the mirror, nevertheless failed to find the toy (object correspondence). Loveland (1986) states, "Children capable of identifying the self-image or of clearly using the mirror for self-inspection may nevertheless fail to perceive correctly the location of reflected objects other than the self " (p. 11)

Loveland interprets the confusion exhibited by the infants in mirror experiments as being a consequence of their unfamiliarity with mirror surfaces in terms of the specific properties and affordances of mirrors. But the experiment also substantiates another point. If the phenomenon of symmetrical states is taken into consideration, the results are perfectly sensible. What the infant identifies as his/her self-image is primarily related to the experience of contingency, while the task of finding the toy involves no immediate experience of contingency or symmetrical movement. The toy finding task is more closely related to the ability of object correspondence (using the mirror to find objects), an interpretation which accords with Loveland's (1986) postulate that infants initially do not fully comprehend the special properties of mirrors (in the sense that the infant can't use mirrors to find objects if the infant doesn't know how mirrors work).

Papousek and Papousek (1974) found that 5-month-old infants are able to respond differentially to a simultaneous-contingent videotape and a pre-recorded tape of the self. Research conducted by Lewis and Brooks-Gunn (1979) demonstrated that even the youngest infants in their videotape studies (9 months) were able to respond differentially to contingent (simultaneous) and non-contingent (pre-recorded) video stimulation, preferring to watch the non-contingent attentively but to play with the contingent (self-controlled) image. Watson (1994) showed that infants can make use of contingency information to distinguish between televised images of their own moving legs and the moving legs of another infant.

From the above discussion it becomes clear that the phenomenon of symmetrical states is fundamentally linked to the process of objectification. The question now remains: How does the infant cognition progress from experiencing symmetrical states, to experiencing him/her self as a separate and distinct subject? The remainder of this section will be dedicated to answering the latter question by analysing the construction process involved in establishing the dichotomous subject objectification (S – S: O).

Much of mirror self-recognition research has been directed to how a person comes to recognize the self, but from a non-local perspective the question is rather, how does it

come to be that the self as a subject is constructed. From the assumption of non-locality follows that we do not have cognitive identities that give rise to cognitive abilities (ala Gallup's theory), but that we have cognitive abilities that give rise to cognitive identities. So the question of objectification can be more precisely formulated as: What are the primary factors involved in the construction of experienced objectification?

Mitchell (1997b) cites research by Gallup, McClure, Hill and Bundy (1971) that investigated whether social interaction per se is necessary for mirror self-recognition. They found that chimpanzees raised in isolation did not recognize themselves in mirrors, whereas chimpanzees raised socially did. Important to note is that chimpanzees brought up in isolation would have no social interactions with conspecifics that would allow their imitation skills to develop properly. Also, Hart and Fegley (1994) found that high levels of infant social imitation between the ages of 15 and 19 months are related to the emergence of self-recognition behaviour. The study demonstrated a significant increase in the percentage of gestures imitated by the infant during the time period directly preceding self-recognition. The logic is as follows: Organisms capable of experiencing or producing symmetrical states develop (mature) this capacity through interaction with others. Through the development of this capacity the organism can become aware of dissymmetrical states, consequently – organisms that do not evince the phenomenon of symmetrical states are unable to become aware of dissymmetrical states. Thus, only organisms that reveal the phenomenon of symmetrical states would be expected to be able to become aware of symmetrical *and* dissymmetrical states.

This developing sense of symmetrical and dissymmetrical states is demonstrated by a study performed by Boulanger-Balleyguier (cited in Loveland, 1986), which found that an infant reacts differently to the self-image depending upon whether others are also visible to him/her in the mirror. Infants under the age of 12 months smiled and babbled in response to the self-image when no other image was present, but ignored the self-image when others' images were also visible. Loveland (1986) also cites a study performed by Dixon in which various stages of behaviour before the mirror was delineated. In the first stage the infant is primarily interested in observing others in the mirror and tends to ignore the self-image. Later, the infant seems to respond

socially to the self-image, then starts to explore by observing his own movements in the mirror. Boulanger-Balleyguier and Dixon's studies suggests that the infant in some definite sense experiences symmetrical and dissymmetrical states, evinced by the infants explicit selective attention focus in front of the mirror.

If the differentiated experience of symmetry and dissymmetry is considered in light of the [R]-element, in terms of the experience of the movement of localities from where emerges rationality, then organisms which exhibit the phenomenon of symmetrical states will develop a form of rational conditioning informed by their experience of symmetrical and dissymmetrical states. Their physiological cognitive capacities will allow them the perceptive ability to experience/interpret the physical world in terms of symmetrical and dissymmetrical patterns.

Originally infants appear to be incapable of every type of representational thought (Case & Khanna, 1981) perhaps due to their neurological immaturity (Fischer, 1987). According to Hart and Fegley (1997) the information about the self that is generated through imitation in the first year of life consequently can't be synthesized and integrated to form a mental model of the self. However, as representational skills emerge toward the end of the first year and through the middle of the second, social imitation becomes more frequent because the self-relevant information that is generated can be integrated into a mental model of the self (Hart & Fegley, 1997). The infant's ability to form mental representations corresponds with Piaget's notion of deferred imitation – the ability to reproduce the behaviour of an absent model - which first appears around 12 to 18 months of age according to Piaget (cited in Hook et al., 2002). Research has however indicated that infants and children are capable of deferred imitation earlier than Piaget proposed (Craig, 1996). According to Ginsberg and Opper (1969), only once a child has developed the ability to form mental images or mental representations of another person's behaviour, and to store and retrieve these from memory, is he/she capable of deferred imitation. What research thus indicates is that at the time that infants demonstrate mirror self-recognition, they are also capable of forming and manipulating mental images.

Concerning the manipulation of mental images the author refers to a hypothesis proposed by Gergeley (1997) who argues that the cognitive capacity for *deductive*

inference is involved in mirror self-recognition. Deductive inference refers to the capability to judge or asses a situation based on logical deduction rather then on appearance. Gergeley bases his argument on developmental literature that indicates that 15-20 month-old infants are capable of deductive inferences as evinced by the successful performance on such non-verbal tasks as sensorimotor weight conservation (Mounoud & Bower, 1974/1975) and, especially, the Piagetian stage 6 invisible displacement task of object permanence (Bower, 1982, 1989; Meltzoff, 1990b). According to Gergeley if the assumption is made that deductive inference underlies mirror self-recognition and the Piagetian stage 6 invisible displacement task of object permanence, one would expect to find a developmental correlation between the emergences of performative success on these two kinds of tasks. In this regard Gergeley cites the following research that substantiates this expected correlation: Natale and Antinucci (1989) concluded that only apes (can self-recognize), but not monkeys (can't self-recognize), class with humans in their ability to solve the Piagetian stage 6 task (see also Parker, 1991); childhood autistics of the right mental age, apart from showing mirror self-recognition (Dawson & McKissick, 1984; Ferrari & Matthews, 1983), are also able to solve the Piagetian stage 6 task (Curcio, 1978; Dawson & Adams, 1984); Bertenthal and Fisher (1978) found a high correlation between the development of mirror self-recognition and object permanence, where the success on the mirror self recognition rouge-mark test strongly correlated with passing the Piagetian stage 6 task. Custance and Bard (1994) argue that the Piagetian stage 6 sensorimotor capacity for mental representation is primary to the infants ability to recognize itself in the mirror (they do not accept the primary role of imitation abilities), an argument which might be considered as indirectly supporting the claim that similar inferential cognitive capacities (deductive inference) are involved in mirror self-recognition and the ability to solve the Piagetian stage 6 task.

Gergeley (1997) adds (as an ending note) that the competence for deductive inference is hypothesized to be a *necessary* and *not a sufficient* condition for mirror self-recognition. There is evidence indicating success on the Piagetian stage 6 task in several organisms, such as capuchin monkeys (Mathieu, Bouchard, Granger & Herscovitch, 1976), dogs (Gagnon & Doré, 1992; Pasnak, Kurkjian, & Triana, 1988), and gorillas (Natale & Antinucci, 1989), in which mirror self-recognition has not been demonstrated. However, in light of the preceding dialectic of this study, if one were

to require firstly the active status of the ability for image representation, deductive inference and the phenomenon of symmetrical states (indicating symmetrical and dissymmetrical awareness), and secondly the functionally integrated convergence of the latter three cognitive capacities, one would have *sufficient conditions* for mirror self-recognition, a *sufficient* logistical [R]-element that can account for the empirical research data. This cognitive model describes an organism that can create mental images that are encoded as to symmetrical and dissymmetrical pattern experiences, and possesses the cognitive capacity for deductive inference that allows the organism to make sense of these differentiated and conglomerating patterns of localized form movement. As such the author has conceptualized a chronological and physiological coherent cognitive model that 'saves the phenomena'.

Furthermore, if one considers the occurrence of infantile transvitism from the perspective of the infant with regards to the immediate post-transvitism experience, one can readily extrapolate to the experience 'fallacious transvitism' (coined by the author). Fallacious transvitism refers to infant who cries when he/she sees another baby getting hurt, but realizes afterwards - either through becoming aware that he/she did not physically experience any pain during the incident, or some care-taking figure indicating to the infant that he/she is fine and that he/she has misinterpreted the situation – that his/her experience has been wrong/mistaken. The infant will eventually fathom that his/her visual interpretation and his/her proprioceptive cognitive schemas do not match (one might expect the infant to be confused by such an experience), as such the sense of a self and separate other becomes an obstinate rational pattern waiting to be inferred.

Consider also the occurrence where the infant begins to react self-consciously when in the centre of other people's attention (Lewis et al., 1989). The infant with a natural propensity to imitate might in the process of attempting to imitate the surrounding others that are staring at him/her, find him- or herself unable to direct his/her actions or gaze on toward a corresponding object. This is opposed to the interaction where the infant imitates a caretaker for example in shaking a rattle-toy (the infant is capable of copying the others' action and directing his/her attention toward a specific and seemingly corresponding object). In the case of the former the infant might find the behaviour of the care-taker simultaneously amusing and confusing, ultimately

evincing a smile or blush as if to say that this is a very funny game, or alternatively, the self-conscious demeanour might reflect the babies growing awareness that the object towards which the others' gaze is directed, might somehow be related to the experience of physical sensations (as such presenting the infant with a novel and strange imitation pattern that is difficult to make sense of). The author will designate this interpreted occurrence 'indicative imitation'. Accordingly, the experience of *fallacious transvitism* and *indicative imitation* might conjunctively contribute to the slowly dawning sense of the self as a separate subject in relation to other separate subjects - the slowly emerging experience of objectification.

The KVM-theory bodes well as an accurate explication for the process of mirror self-recognition, but mirror self-recognition is not the subject matter this section is primarily concerned with (mirror self-recognition is only utilized as a possible index for the investigated concept). The primary concern of this section is the process of objectification, the clear and overt demonstration of self-awareness and other-awareness in the sense of a self-reflective form of cognition. Therefore, what happens in the case of a blind person, a person who would be unable to match kinaesthetic and visual schemas/modalities? To be sure, blind people are under normal circumstances very much self-aware. A possible answer to this question, is found by considering the longstanding psychological problem of perceptual unity – how does a person coordinate information that comes from several different modalities but emanates from a single source? Experimental research answers the question with the concept of 'amodal perception'. According to Stern (2000) research has demonstrated the infant's capacity to transfer perceptual experience from one sensory modality to another and has done so in an experimental format open to replication. Consider the following cross-modal matching evinced by infants: *audio*-visual cross-modal matching (Haith, 1980; Kuhl & Meltzoff, 1982; Lewcowicz & Turkewitz, 1980; MacKain, Studdert-Kennedy, Spieker & Stern, 1982, 1983;), tactile-visual matching (Meltzoff & Borton, 1979). Accordingly Stern (2000) states that infants thus appear to have an innate general capacity, called 'amodal perception', to take information in one sensory modality and somehow translate it into another sensory modality. Thus, if the audio and the tactile modalities are related to the visual modality, and the visual modality is related to the kinaesthetic modality (according to KVM-theory), then the audio, tactile and kinaesthetic modalities can all be inter-related. One can even argue

that modality matching might occur within the same modality through the interaction of different limbs of the same body, for example: a person can simultaneously experience proprioceptive information (one modality) from both arms (different limbs) and can without looking at them experience whether the two arms are moving synchronously or not (match modality information).

A simpler argument to explain the self-awareness of blind people might proceed as follows: Imitation and mirror self-recognition are related (Custance & Bard, 1994; Hart & Fegley, 1994; Hyat & Hopkins, 1994; Miles, 1994; Patterson & Cohn, 1994), and mirror self-recognition is considered to be related to self-awareness (Damon & Hart, 1982; Lewis & Brooks-Gunn, 1979, 1984), hence imitation can be considered to be related to self-awareness. Blind people are capable of imitation (example: verbal imitation), so consequently the physiological mechanisms involved in the ability of imitation might also be involved in the process of blind people becoming self-aware.

The author will now exposition a succinct synopsis to elucidate the objectification process (see Figure 1) formulated in the above disquisition.

It is proposed that the human infant originally experiences the world of localities in an undifferentiated manner. Progressively the neonatal behaviour seems to indicate an autonomous propensity for the phenomenon of symmetrical states - this propensity develops juxtaposed to the maturing cognitive capacities of mental image representation and deductive inference. Combined with the practical peculiarities of fallacious transvitism and indicative imitation, the basic character of objectification begins to take shape (as exhibited through mirror self-recognition) and imbues the [R]-element with a self-reflective form of comprehension. These primitive beginnings emotionally *suffuse* and haunt the ever-elusive dichotomous subject objectification experience. This *suffusion* moves through and over objectification in the opaque form of ‘reciprocated subjectification’ (the particular choice of name will become clear as the discussion progresses and will be specifically addressed at the end of this section). If dichotomous subject objectification represents the anatomy of localized experience, then reciprocated subjectification represents the physiology of localized experience.

To animate reciprocated subjectification, the author will now explicate the essential role the [E]-element plays in the process of objectification. The functionality of the [E]-element in the formation of the dichotomous subject objectification is crucial, especially in light of the amalgamated physiological relationship of the [R]-element and the [E]-element described in section 4.1. Regarding available research related to the emergence of self-and other-awareness using mirror self-recognition and imitation as indexes, the possible involvement of the [E]-element in this objectification process is conspicuously lacking in an investigative sense. To sufficiently characterize the notion of reciprocated subjectification the author will conceptually integrate the notion of 'affect attunement', as described by Stern (2000), thus shedding light on the role played by the [E]-element in the objectification process.

According to Stern (2000) for there to be an intersubjective exchange of affect (for the purposes of this section the terms 'affect' and 'emotion' will be considered readily interchangeable), strict imitation is not sufficient. Stern enumerates three processes that must take place: (a) the parent must be able to read the infant's feeling state from the infant's overt behaviour (b) the parent must perform some behaviour that is not strict imitation but nonetheless corresponds in some way to the infant's overt behaviour (c) the infant must be able to read this corresponding parental response as having to do with the infant's own original feeling experience. To establish some kind of emotional connection, the mother must go beyond the basic imitation character that has been the salient feature of her social repertoire during the first six months of the infant's life (Kaye, 1982; Uzgiris, 1981, 1984; Malatesta & Izard, 1984).

Stern (2000) states that around nine months the intersubjective exchange of affect becomes clearly detectable, and that for this exchange to take place, different behavioural expressions occurring in different forms and in different sensory modalities must be interchangeable. If a certain gesture by the mother is to be 'correspondent' with a certain kind of vocal exclamation by the infant, the two expressions must share some common currency that permits them to be transferred from one modality or form to another. This common currency is amodal perception (see earlier discussion). Stern gives the following examples:

- A nine-month-old girl becomes very excited about a toy and reaches for it. As she grabs it, she lets out an exuberant 'aaaah!' and looks at her mother. Her mother looks back, scrunches up her shoulders, and performs a terrific shimmy with her upper body, like a go-go dancer. The shimmy lasts only about as long as her daughter's 'aaaah!' but is equally excited, joyful and intense.
- An eight-and-one-half-month-old boy reaches for a toy just beyond reach. Silently he stretches out towards it, leaning and extending arms and fingers out fully. Still short of the toy, he tenses his body to squeeze out the extra inch he needs to reach it. At that moment his mother says, 'uuuuuh….uuuuuh!' with a crescendo of vocal effort, the expiration of air pushing against her tensed torso. The mother's accelerating vocal-respiratory effort matches the infant's accelerating physical effort.

Affect attunement, then, is the performance of behaviours that express the quality of feeling of a shared affect state without imitating the exact behavioural expression of the inner state. Stern holds that the embedding of attunements is so common and most often so subtle that unless one is looking for it, or asking why any behaviour is being performed exactly the way it is, the attunements will pass unnoticed. To operationalize his conceptualization of 'affect attunement' for clinical purposes, Stern (2000) identifies those aspects of a person's behaviour that could be matched without actually imitating them. He indexes three broad categories – intensity, timing and shape – and differentiates six more specific sub-categories – absolute intensity, intensity contour, temporal beat, rhythm, duration, and shape.

Stern (2000) notes that the notion 'affect attunement' is similar to the idea of 'mirroring', yet differs fundamentally. Mirroring in a Lacanian sense (1966/1977), notes that reflecting back an infants's feeling state is important to the infant's developing knowledge of his/her own affectivity and sense of self. However, used in the Lacanian sense, mirroring implies that the mother is helping create a state of being within the infant's emotional experential world – the Other – which fundamentally serves an alienating function. This is in contrast with 'affect-attunement', which has no alienating telos beyond the basic disposition of S – S: O that becomes conditioned

as a form of interpretation and experience. As such no rubiconic alienation is implied, and more overtly, the reciprocated occurrence of this symmetrical amodal interaction fosters positive emotional states and a sense of belonging (Goleman, 1996).

Stern (2000) also distinguishes 'affect attunement' from empathy. He holds that attunement occurs largely unconsciously and almost automatically, while empathy involves the mediation of conscious cognitive processes. These two constructs do however share the *basic matrix of emotional resonance*, without which neither can occur (Hoffman, 1978; Basch, 1983). According to Hoffman (1978) the basic matrix of emotional resonance encompasses the first of four stages in the development of empathy. Whence this notion of 'affect attunement' might also facilitate in formulating an understanding of the psycho-physiological processes related to the domain of autism. Mitchell (1997a) writes that although high-functioning autistic children develop emphatic understanding of others (but less than do normal children [Yirmiya, Sigman, Kasari & Mundy, 1992]), the most general description of social impairment in autism is the lack of empathy. Autistic children are noted for their indifference to other people's distress, their inability to offer comfort (Frith, 1989). Gillberg (1992) states that autism is a *disorder of empathy*, resulting not from an inability to feel emotions, but instead from a difficulty in understanding that others have inner worlds.

Considering research data related to autism the following conjectures can be made: The emotional brain circuitry of the autistic infant (at around nine months) involved in the infant-caretaker interaction (affect attunement process prominent) might be deficient, or highly underdeveloped. The *basic matrix of emotional resonance* (the shared platform of attunement and empathy) can be implicated as the defective cognitive capacity in autism. Autistic children do well on visual perspective taking tasks (moving an object to show another person various requested facets of it), as well as on some cognitive perspective-taking tasks (telling about what another person perceives) (Hobson, 1984; Reed, 1994; Reed & Peterson, 1990;). Autistic children's functional perspective taking skills indicate that the brain circuits involved in these processes are adequately developed. Perspective-taking skills, as developed during the third stage of empathy development (Hoffman, 1987), mean that a child can deliberately take the perspective of another person; it is studied where children are

verbally *instructed* to take the view of others (Selman, 1980; Wimmer & Perner, 1983). As such perspective-taking skills indicate higher neocortical functions, matured brain dynamics distinct from the more primitive brain circuitry involved in the first stage of empathy – the basic emotional resonance stage. Accordingly, Hoffman's four stages of empathy development must not be viewed in terms of a serial stage progression, but rather as parallel phases interacting reciprocally according to the underlying physiological brain capacities. This implies that the third stage of empathy can occur without the mature development of the first stage.

Thus the basic sense of empathy often times evidenced in autism (Yirmiya et al., 1992), might be strictly (or predominantly) related to the higher cognitive capacity related to perspective taking, yet remaining essentially uninformed by more primitive emotional circuitry (prevalent during around 9 months). As such the empathy evinced by autistic children might have a very different character than the type of empathy a person with normal physiological brain circuitry might experience/demonstrate. The latter formulation would explain why autistic children do not appear to be deficient in the experience and interpretation of their own emotions (Gillberg, 1992), yet seem deficient in empathizing with other people's distress (Frith, 1989). The emotions that autistic children experience and are able to understand, are postulated by the author to be related to specific amalgamated emotional and rational brain circuitry of the neocortical-hippocampul pathway (discussed earlier), which is related to the process of objectification (recall that autistic people can recognize themselves in the mirror). While the experience of affect attunement prevalent from the period of nine months onward (in normal children) is postulated by the author to be correlated with brain circuitry related to the absence of proper objectification (possibly the amygdala-visual cortex circuitry – research has indicated the latter brain circuitry to be strongly related to empathy [Brothers, 1989]) – as such accepting a much more emotional character (less rational). Accordingly autistic children will demonstrate other-awareness through their ability for perspective taking, mirror self-recognition and imitation; will experience and interpret their own emotions normally; yet will struggle to autonomously extrapolate from their own experiences to that of others (Baron-Cohen, Tager-Flusberg & Cohen, 1993; Harris, 1989) as a consequence of their faulty *basic matrix of emotional resonance* capacities related to Hoffman's (1987) first stage of empathy development.

Research indicates that affect attunement assumes fundamental significance in the later development of the self as subject. Goleman (1996) cites a study conducted by Prentsky investigating criminals who had committed the cruellest and most violent crimes. It was found that the one characteristic that set them apart from other criminals was that they had been shuttled from foster home to foster home, or raised in orphanages – life histories that suggest emotional neglect and little opportunity for attunement. Stern (2000) indexes three different forms of potential psychopathology that are visible during the period beginning at seven to nine months and ending at about eighteen months (note the temporal correspondence of affect attunement with the onset of mirror self-recognition): neurotic-like signs and symptoms; personality malformations; and self pathology. These potential forms of psychopathology are related to what Stern identifies as 'misattunement', 'unauthentic attunements', 'over- or underattunement', and 'non-attunement'.

There is an important distinction to explicate in terms of an autistic child versus a 'normal child': A normal child can under unhealthy circumstances experience 'misattunement', 'unauthentic attunements', 'over- or underattunement', or 'non-attunement'; while the autistic child will not experience these adverse attunement states, or at most, only experience attenuated versions of the latter – due to the temporally specified deficient brain circuitry postulated. Accordingly, a mother that exhibits unnatural or adverse attunement propensities will have a different influence on an autistic child than on a 'normal child'.

From the above investigative exposition of objectification, the nucleic importance of the phenomenon of symmetrical states and affect attunement can readily be gleaned (affect attunement is also suffused with symmetry dynamics, these dynamics will be expositioned in section 6). The experience of the self as subject (in terms of the process of objectification) is therefore permeated by the essential rational and emotional character of these two nucleic processes described above. Hence, to aptly acknowledge these rudimentary and pervasive influences related to the construction of dichotomous subject objectification, the motivating drive of the subjective self is termed 'reciprocated subjectification'. This designation semantically incorporates the essentially pleasant nature of naturally reciprocating interactions as evinced in the

phenomenon of symmetrical states and affect attunement, and conversely the unpleasant nature of unreciprocated interactions. Consider in this regard an experiment conducted by Stern (cited in Goleman, 1996) where mothers were instructed to deliberately over- and under-respond to their infants. Rather than the infants matching their mothers in an attuned way, the infants responded with immediate *dismay and distress* (unpleasant). Consider also the research performed by Asendorph and Baudonniérre (1993) where, during synchronic imitation, the two infants 'enjoyed' the reciprocity inherent in their play, as indicated by their 'positive mood'; moreover, during this study the desirability of reciprocated interaction was also revealed by the prolonged phases of synchronic imitation produced by dyadic infants clearly evincing the capability of objectification. These indications must be considered above and beyond the psychopathological ramifications of adverse attunement discussed above.

Compendiously stated: the notion of reciprocated subjectification represents a complex rational and emotional elaboration of the phenomenon of symmetrical states as an expression of the conditioned cognitive experience of the movement of locality. Reciprocated subject interactions are experienced as pleasant, and thus desirable, while unreciprocated subject interactions are experienced as unpleasant, and thus undesirable. Accordingly, from a theoretical non-locality framework, the desire of man is the desire of reciprocated subjectification. The desire for reciprocated subjectification describes the convolution of the biological needs of the physical body and the phenomenon of symmetrical states. In the absence of the cognitive capacity for symmetrical phenomenon experience, S – S (later called non-local perceptum) experience of locality would possibly resemble the envisaged conditioned experience of lower animals (animals who aren't able to recognize themselves in the mirror).

The ceremonial master of the ephemeral dancing cascade of objectification does not carry the name of logic - no, logic is a blind sceptre impudently flailed in the air according to the desire of this king of kings, this desire of reciprocated subjectification, the desire of man. This desire commands the mighty army of the [E]-element – an army marching in perfect file and rank according to the vicissitudes of 'knowing', of 'needing to know'. Objectifications equate what a person believes he/she 'knows' or 'does not know'. The 'need to know' (even if it is the need to

know that you are ignorant), the clinging to objectifications, is based on this desire to allow or create reciprocated subjectification, or conversely the desire to avoid or control unreciprocated subjectification.

Before the conditioned anatomy of S – S: O is dissected, the author will critically examine Lacan's mirror stage using contemporary empirical research in the domain of mirror self-recognition (related to the preceding discussion) as a referent framework.

4. 3 The Lacanian mirror

This section will paint a picture of the reflected neonatal image in the Lacanian mirror and make visible the pseudo-colouring there-of through super-positioning on the empirical canvass of the contemporary self-recognition mirror. The author will demonstrate that Lacan's infant, standing on the legs of the Other, has never been able to walk because these alienating limbs have no veridical substance.

Lacan (1966/2001) writes:

> This behaviour contrasts strikingly with the indifference shown even by animals that perceive this image, the chimpanzee, for example, when they have tested its objectal vanity, and it becomes even more apparent when one realizes that it occurs at an age when the child, as far as instrumental intelligence is concerned, is backward in relation to the chimpanzee, which he catches up with only at eleven months. (p. 20-21)

Custance and Bard (1994) found that mirror self-recognition in chimpanzees appear to be consolidated between the ages of 24 and 30 months, this is in comparison with human infants who exhibit mirror self-recognition between eighteen and twenty four months (Johnson, 1983; Chapman, 1987). Thus the research indicates that human infants compared to chimpanzees are 6 to 12 months developmentally more advanced in terms of mirror self-recognition. This of course renders fallacious Lacan's claim that the human infant is 'backward in relation to the chimpanzee' during the early

months of life. But more importantly, it reveals that in some definite sense, Lacan did not correctly interpret mirror related behaviours as it pertains to humans and animals.

The author posits that there are fundamental assumption similarities between Gallup's theory and Lacan's formulation of mirror interaction. Recall that Gallup's theory holds that a self-concept or self-awareness is necessary for mirror self-recognition, in a similar vain, Lacan's mirror stage assumes that the infant is self-aware, in the sense that to experience oneself as fragmented, requires that the infant be aware of the self as fragmentary. Furthermore, the infant being aware of the 'whole' other, implies that the infant is 'other-aware', which in retrospect of the literature discussed earlier (indicated that self-awareness and other-awareness are synchronous), indicates that the infant is self-aware. Thus, implicit to Lacan's theory is the assumption of a definite sense of self-awareness that facilitates mirror self-recognition, as such the theory exposes itself to the same methodological difficulties as those evinced by Gallup's theory (see section 4.2).

Also, the notion of the infant experiencing its own body as "fragmentary" and "motor-uncoordinated" (Lacan, 1966/2001, p. 4) - whence would be the provenance of such an experience? If an infant has never experienced a whole body, or has never experienced a body where the motor functions are co-ordinated, how would the infant be able to recognize that its body is *fragmented* or *motor-uncoordinated*? By the time the infant demonstrates self-and other-awareness, which appears to occur around 18 to 20 months (Asendorph & Baudonniére, 1993), the infant also demonstrates a definite sense of motor-control – the infant can perform complex tertiary circular reactions by the age of 12 months (Hook et al., 2002) - and will consequently not experience a sense of fragmentation due to uncontrollable limbs. The conjecture that the infant's early bodily experiences are anxiety provoking (due to a sense of fragmentation and uncoordination) is accordingly based on unsubstantiated logic. Hence, if this infantile state of anxiety is as it were without logical merit, it would be disconcertingly presumptuous to postulate that the infantile awareness projects itself into, or identifies with the external 'gestalt'. And if this primary projection/identification does not take place, Lacan's alienating Other is never born.

Concerning the fragmentary body: if the conjecture is made that the infant experiences the body and the environment originally in an undifferentiated fashion (as Lacan does – see section 3.1), it would be dubious to infer that the infant experiences the body parts in a differentiated manner. Surely *undifferentiated* perceptive experience would not be able to *differentiate* where the body ends and the environment begins? The limbs would be as much a part of the body as the body is a part of the environment. Even if one allows for an undifferentiated infantile perception incapable of differentiating its own body from the environment, yet capable of differentiating fragments, one can readily state that the experience of limbs and external bodies might be equated, in the sense that external bodies might be experienced by the infant awareness as larger or different kinds of limbs, or conversely, that the limbs might be experienced as autonomous bodies. Consequently one might in accordance with such an allowance be faced with the infantile awareness projecting itself into, or identifying with its own body parts. As such the arm can function as the alienating Other and the subject will, according to Lacanian theory, always address its truth to its arm. A rather precarious logical implication.

Consider also the following: If we were to attribute any validity to the KVM-theory (empirical evidence implores us to do so), this would be conceptually problematic for Lacan's mirror stage. Recall that the KVM-theory postulates that passing the mark test (test for mirror self-recognition) is a consequence of the capacity for matching kinaesthetic, proprioceptive and somasthetic sensations of one's own body positions, with the visual images of one's own body and the other's body. If an infant brain is capable of performing the rather complex cognitive task of matching different modalities, it would be wholly justified to assume that the infant brain is capable of allowing the more basic cognitive task of experiencing, or is in some sense being aware of the proprioceptive sensations emanating from the limbs. Experiencing the proprioceptive sensations from the limbs can be correlated with not experiencing proprioceptive sensations from other bodies (external bodies). As such it is quite possible that the infant will, during the onset of mirror self-recognition, have some sense of a unitary proprioceptively experienced body, as opposed to the fragmented body experience postulated by Lacan.

Also, Lacan (1966/2001, p. 3) explicates how the identification of the infant with the gestalt, the external "whole image", is a consequence of the infant experiencing himself/herself as "animated by turbulent movements" and that the infant anticipates the "maturation of his power" in the external form of the gestalt. This explication correlates with Lacan's description of the infant as 'motor-uncoordinated' at the time of mirror self-recognition. Loveland (1986) cites research by Lewis and Brook-Gunn indicating that the infant appears to become aware of contingency between self-movement and mirror self-image movement at around three to eight months. Subsequently Loveland states, "At this level the baby's achievement can be viewed as a sensory motor procedure that produces a desired result (control over the mirror image)." (p. 19)

Thus, in contrast to Lacan (1966/2001) interpreting the gestalt mirror image from the infant's perspective in an "anticipatory power maturation sense" (p. 3), the specified research indicates that the infant's original experience with the gestalt mirror image between three and eight months might represent an expression of the infant's 'maturing sense of power'. The former bespeaks an outside image being invested with a sense of control and power, and consequently making the infant feel helpless and powerless with regards to his/her own position, while the latter bespeaks a sense of power and control over an outside image consequently making the infant feel powerful and in control.

Also the ability to imitate from as young as 9 months (Bauer & Mandler, 1992; Hanna & Meltzhoff, 1993) in conjunction with the Piagetian notion of secondary circular reactions which infants demonstrate from four to eight months (Papalia, Olds & Feldman, 1998), suggests some succinct sense of motor-control. The cognitive ability of the mirror self-recognizing infant therefore does not bespeak the Lacanian signification of *turbulent movements* and *motor-uncoordination*.

Furthermore, with clandestine presumptuousness, Lacan's mirror stage formulation implicitly assumes that six to eighteen month old infants necessarily grasp the idiosyncratic properties of mirrors. Lacan (1966/2001) assumes that the infant's "flutter of jubilant activity" (p. 2) indicates that the infant is aware that the *whole image* reflected in the mirror is its own, and that the infant recognizes this external personal gestalt form to be diametrically opposed to his/her own fragmentary body. Loveland (1986) proposes that the mirror is a special case in visual perception, whose

properties and whose meaning for the individual must be discovered gradually, and that the meaning or significance of a mirror image (self or other) changes for the young child with experience and exploration before the mirror. She states that while the perceptual properties of the mirror situation are incompletely understood, the significance of the mirror image may be only partly understood or understood only with respect to particular cases. Recall the study by Loveland (1984) described in section 4.2 where many of the infants were able to seemingly identify themselves in the mirror, yet were unable to locate the toy that they could see in the mirror (incorrect searching strategies included among others – grasping at the mirror, or searching behind the mirror). The infant behaviours substantiate the idea that infants do not fully comprehend the meaning or properties of the mirror. These results corroborate the findings of a study conducted by Zazzo (cited in Loveland, 1986). A large number of children were investigated in the children's own homes – the experimenters set up a situation in which the mother entered silently from behind in the child's mirror view with a hand full of candy. The experimenter drew the child's attention to the mother's image and urged the child to get the candy. Forty percent of the children between the ages of three-and-a-half and four years approached the mirror and tried to search behind it to obtain the candy. The findings suggest that the business of learning about the mirror as a perceptual situation is not yet complete at the time when self-recognition tasks are solved.

Loveland's research implies that Lacan's assumption that the six-month-old infant understands the mirror image as his/her *own whole* image (see Lacan, 1966/2001) is doubtful (more plausible at eighteen months, but by no means definite). The research-supported hypothesis that infants do not necessarily fully comprehend the idiosyncrasies of reflective surfaces before or during initial mirror self-recognition behaviour, suggests that infants do not during this period necessarily understand the significance of the reflected image.

The foregoing dialectic demonstrates that Lacan's mirror stage formulation is not supported by empirical evidence and applied logic. As a consequence the conceptualization of the Other as to its disposition and essentially alienating function thus appears fallacious.

4. 4 Dichotomous subject objectification

The author posits that in terms of the premise of non-locality, there is no ontological central I, no reified subject position, no petrified or coagulated ego; rather the author states that there is constructive and destructive interference of S – S: O through the ubiquitous substrate of S – S at localized and ephemeral conjunctive intersections. The intertwined converging and diverging S – S: O will in this section be explained in terms of a topographical exposition and the dynamic discontinuous processes that drive the form there-of. The non-locality signification function of S – S will be substituted with an antonomasia designation of 'non-local perceptum'. This term describes a form of perception that accepts its logical provenance from the premise of non-locality, as such it encompasses the unitary existence of locality and non-locality and accounts for the locality experience of non-local phenomena. The word 'perceptum', is specifically formulated using the Latin suffix '-um', this is a neutrum inflection indicating neither masculine nor feminine emphasis – an androgynous signification.

Non-local perceptum experiences localized 'movement', and becomes conditioned as to the [R]- and [E]-element in accordance with the physiological bodily nature and biological cognitive capacity. Non-local perceptum permeates objectification in the form of reciprocated subjectification. It is to the topographical objectification of non-local perceptum that the author will now turn.

The dichotomous subject objectification will be delineated by the author as to three distinct forms of interpretation for functional and practical purposes. The three forms are root-objectifications, stem-objectifications and leaf-objectifications. These differentiated objectifications will be considered in terms of the physiological brain development of the maturing child.

Root-objectifications *primarily* refer to the early awareness experiences of the infant from birth (experiences within the womb can be included but this is beyond the scope of this thesis) to roughly eighteen to twenty two months, the time period before the infant is capable of decent objectification. Root-objectifications imply the pre-verbal

phases of life during the early maturing stages of the neocortex. The brain physiology predominant during this period correlates with the primitive emotional brain circuitry postulated to be involved in the basic matrix for emotional resonance capacity – the early phases of empathy development (see discussion in section 4. 2). These primitive emotional brain circuits constitute the experience of an early and seemingly different kind of [E]-element, as was alluded to in the discussion interpreting the 'distorted empathy' of autistic children (section 4.2). The infantile experience of emotion during the 'affect attunement' phases, occur in a period preceding the capability for objectification. Accordingly it should be clear that the emotional circuitry involved during the early stages of neocortical development, the period preceding mirror self-recognition, is different in comparison to the emotional circuitry involved during stages when the infant is capable of objectification and the neocortex has reached a higher level of maturation. Hence, the emotional matrix laid down during the early months of life will have a fundamentally different character than the myriad of later emotional experiences related to the active ability of objectification (related to the thalamus-cortex-hippocampul pathway).

Root-objectifications *secondarily* represent emotional experiences where the hippocampus might completely shut down due to the stress of a traumatic event, as such having no functional capacity to form new memories during the traumatic event - rendering it impossible to later excavate a conscious memory there-of. During such an experience the thalamus-amygdala pathway can act unilaterally. This pathway subverts the neocortex and so acts outside of awareness, outside of direct objectification experience. The traumatic experience can, accordingly, in such a scenario adopt the form of a non-objectification emotional reactive memory. Later experiences exhibiting similar characteristics to the original traumatic event might consequently induce an emotional response that completely overwhelms consciousness, and afterwards remains completely non-sensical to the person experiencing this emotional occurrence (because there is no conscious memory of the original traumatic event).

The author specifically chooses to use the word 'root-objectification', although the cognitive capacity for objectification has not as yet been sufficiently/functionally developed during this early period. The reason being the following: This early

emotional matrix of experience is experienced and interpreted by the later more matured and objectifying cognition. Root-objectifications fundamentally inform and diffuse later conditioned objectification experiences. The author designates this process – 'Retro-transposed objectification', which can be explained as follows: Imagine a young boy by the name of Sam who didn't know what to do with his life. One day after school, while waiting on a bench for the bus to arrive, Sam and an older man sitting next to him on the bench started up a conversation. Sam found this stranger very intriguing – he had a peculiar hairstyle and a very particular and unfamiliar style of dress. This man told Sam all about the wonders of science and the mysteries of the universe. The older man spoke in a very animated and enthusiastic manner, his eyes lighting up as he explained the anomalies of time. He told Sam all about Einstein's theory of relativity and the bizarre phenomena of quantum physics. Sam was fascinated by these thoughts and after that day his life was never the same. Sam had discovered his passion and henceforth dedicated his life to the pursuit of unravelling the mysteries of space and time. Sam grew up to be a brilliant scientist and some years later invented the first time machine. Miraculously the time machine worked and Sam managed to travel back in time. He found himself in the past, sitting on a small bench in a rather familiar looking environment. Still dazed and disorientated by the time-travel journey, Sam began to speak to a young boy sitting next to him on the bench. Slowly becoming aware that his time-travel journey had been successful, he exuberantly told the young boy all about time and the anomalies there-of. After about half an hour of animated story telling, the young boy's bus arrived. Sam the scientist greeted his young friend and with a sparkle in young Sam's eye he made his way on to the bus.

The origin of root-objectification is a self-perpetuating circle. It is the person capable of objectification that by reflecting on the past and experiencing remnants of past emotions in the present, who autonomously constructs the pith of root-objectifications. As such objectification pervades the past and the future. Root-objectifications suffuse stem- and leaf-objectifications and becomes itself suffused by stem- and leaf-objectifications.

Stem-objectifications and leaf-objectifications are reciprocally related. Leaf-objectifications are related to specific interpretive experiences, while stem-

objectifications represent thematic conglomerations of the specific experienced leaf-objectifications. If leaf-objectifications are the specific character interactions of a mythological tale, then stem-objectifications represent underlying themes pervading the mythological tale, as such animating the telos of the characters. Stem-objectifications and leaf-interactions are continuously interacting in a discontinuous dance of synchronous reinforcement or dissynchronous confrontation. Where leaf-objectifications inductively inform, stem-objectifications deductively impose. Stem-objectifications are the converging lines of generalized characteristics emanating from the multifarious nodal points of particular leaf-objectifications. These intersectional convergences then protrude across the spectrum of particular interactions searching for coherent inter-relations of specific leaf-objectifications.

Stem-objectifications can be correlated with the clinical conceptualization of 'generalized episodes'. According to Stern (2000) a generalized episode is a structure/abstract representation about the likely course of events, based on the average of experiences. It creates expectations of actions, feelings and sensations that can either be met or violated. The provenance of this meeting or violation of expectations assumes the form of the interpreted leaf-objectification.

The conceptualization of stem- and leaf-objectifications is further informed by a comparative understanding of George Kelly's 'personal construct theory'. Kelly (1969) deduced from his therapeutic and experimental work that his clients' problems arose from the particular way they interpreted the circumstances of their lives. As methodological intervention he proffered his clients novel and sometimes 'absurd' interpretations of their circumstances and behaviour. Kelly found that what was of primary importance for the relief of psychological symptoms, was not the accuracy of his interpretations, but rather the simple fact that the interpretations encouraged his clients to see their problems in a new way. For Kelly the essence of personality is the *construction system*, which the individual uses to predict and control events (cited in Meyer et al., 1997). The construction system comprises a very large number of constructs (notions, ideas, concepts), each with their own idiosyncratic formal and functional properties. The properties of the construction system and of the individual constructs are what determine a person's behaviour. Kelly's explicative formulation

of these constructs will briefly be correlated with the differentiated forms of objectification.

Consider for example comprehensive and incidental constructs, central and peripheral constructs, and the dichotomous classification of constructs. Firstly, regarding the dichotomous classification of constructs: Kelly emphasizes that constructs are dichotomous or bipolar. This implies that a construct consists of two opposites, such as 'beautiful-ugly', 'man-woman' and 'true-false'. As such constructs are used to make predictions by categorising objects or an anticipated event into one of the two opposing classes (cited in Meyer et al., 1997). Central and peripheral constructs refer to the concentric relationship between constructs. According to Sechrest (1983) central or core constructs are important for the individual's maintenance of himself/herself as a person, while peripheral constructs have only marginal implications for self-maintenance. For example: for a person with high moral values, a construct like 'right-wrong' might constitute a central construct, while a construct like 'thick book - thin book' might equate a peripheral construct. Comprehensive and incidental constructs are differentiated as follows: a comprehensive construct has a broad range or context, which means that it is applicable to a broad set of events (elements), whereas an incidental construct has only a limited range (cited in Meyer et al, 1997) . For example the construct 'good-bad' as used by most people is a comprehensive construct because a great variety of events (elements) can be classified in terms of it. Conversely, a construct like 'my *Duncan Fearnly* bat – my *Gun and Moore* bat' is incidental because it has bearing on a single set of elements only.

Considering the construct system in terms of objectification. Comprehensive constructs are related to stem-objectifications and incidental constructs are related to leaf-objectifications. Regarding central and peripheral constructs: central constructs can be equated with any objectification carrying significant emotional weight, be it stem-or leaf-objectifications. Inversely, peripheral constructs are related to objectifications that assume less emotional importance in the person's life. A case in point: a father lying on his death bed tells his younger son that he must always be there for his mother (the father's wife), and that his helping her with small things, like taking out the garbage, is very important. Consequently, a leaf-objectification like 'me taking out the garbage – me not taking out the garbage', constructed in relation to

a significant other subject position – the father, can be considered a central construct due to the gravitatious emotionally laden character there-of. The act of taking out the garbage, can as such assume fundamental importance for the boy in terms of his self-evaluation.

Regarding the dichotomous nature of constructs: As already demonstrated by way of practical example in the directly preceding case in point, a person's ability to perceive *similarities and differences* between events, imbues objectification with the succinctly differentiable form of inter-subject experiences. This can be related to the *phenomenon of symmetrical states* explained earlier, which was demonstrated to be essential in the formation of self- and other-awareness, the pristine form of objectification.

Conspicuously, Kelly's 'personal construct theory', gives little consideration to unconscious processes as emphasized in psycho-dynamic theory. Correlatively the animating forces of root-objectifications (in terms of influencing the behaviour of the person), and the physiological and psychological phenomena that drive construct formation, remain unexplored and essentially unaccounted for.

Post-cedingly the author will expound a prototypical matrix of rudimentary objectification development.

This prototypical matrix is infested with two inclusively differentiable fields of objectification experience that dehisce around the desire for reciprocated subjectification. The primary field of objectification experience encircles the dynamic interactive domains of root-objectifications on the one hand, and the domain of interrelated stem- and leaf-objectifications on the other (see appendix A). The nature of this interaction is determined by the allowance or disallowance of reciprocated subjectification in, alternately, the domain of root-objectification, and the domain of stem-leaf-objectifications (see appendix for elucidating diagram). Adverse emotional states induced by dissymmetrical interactions during the first eighteen to twenty-four months of life (affect attunement predominating in the absence of active objectification capabilities), establish particular emotional neural circuitry patterns. These negative emotional undercurrents perniciously simmer about the threshold of the later maturing, cognitively more complex stem-leaf-objectification interactions.

Specific interactional configurations of these two domains might then manifest as psychotic episodes or states, in such cases the alien emotional character of root-objectifications overwhelm the comparatively fragile [R]- and [E]-elemental amalgamation of leaf-stem-objectification processes. The particulars of these specific interactional configurations connecting the two pertinent domains are beyond the scope of this thesis.

The secondary field of objectification experience is signified by the reciprocal relationship of stem- and leaf-objectifications described earlier - the deductive thematic web of stem-objectifications cast out over the sea of multifarious fish (leaf-objectification) in an attempt to satisfy the hunger of the fisherman, the desire for reciprocated subjectification (see appendix A). This field is characterized by the implementation of the [R]-element to manage the [E]-element, to appease the desire of reciprocated subjectification. The allowance or disallowance of reciprocated subjectification becomes encoded as to the more complex forms of 'the safe subject', 'the belonging subject', 'the deserving subject', or 'the worthy subject' – to name but a few stem-objectifications. This secondary field interprets verbal as well as non-verbal cues in terms of allowance or disallowance of the subject form. This subject form, constructed in accordance with allowed or disallowed desire, implies ipso facto conditions of worth. The Rogerian notion of *unconditional positive regard* (see Hergenhahn & Olson, 1999; Meyer et al., 1997), exemplifies the illusion of the fulfilled desire of reciprocated subjectification. The birth of objectification (root, stem, leaf) represents the birth of conditions of worth. Objectification is the apple of the garden of Eden that all subject experiences bite into everyday. The experience of the self as subject, positive or negative, implies the condition of reciprocated subjectification. Roger's *unconditional positive regard* never extends beyond a particular form of objectification *conditioning* (recall also the conditioned character of all rationality – the [R]-element). The accomplished freedom of 'Humanism' equates a bigger box, essentially a pseudo-freedom. The simulacrum of subjective freedom informs all objectification and guards the gates of the garden of Eden. This inexorable state of conditioned worth, of conditions of worth, is the provenance of the psycho-dynamic defence-mechanisms conceptualized by Sigmund Freud. From the premise of locality it would be quite valid to envisage the human being as one big

walking defence-mechanism, for in a sense the human experience (the capability of objectification) differs only in degrees and intensities of objectification.
A premise of non-locality transforms the veridical pessimistic and nihilistic elements of objectification into illusory wails of perception that obscure depths of being unfathomable to the rich-man, the man laden with subject suppositions.

Section 5 will be dedicated predominantly to the further elucidation of this secondary field of objectification, as such investigating the logic non-local perceptum would imply for the objectification experience of localized movement. Subsequently, in section 4.5, the author will investigate the logic non-local perceptum implies for logic.

4. 5 The intuitive-element

To facilitate an understanding of non-local perceptum, S –S will be formulated in terms of a Socratic interpretation. This Socratic interpretation will be based on the historical literary distinction made between the Socrates of the early Platonic dialogues and the Socrates of the later Platonic dialogues (see Vlastos, 1991). The alternate philosophies put forward by these two 'differentiable' Socrates' are the essence of what the author has posited as *the brilliant Greek mistake* (see also introduction and conclusion). Vlastos (1991) writes:

> …in different sets of dialogues he (Socrates) pursues philosophies so different that they could not have been depicted as cohabiting the same brain throughout unless it had been the brain of a schizophrenic. They are so diverse in content and method that they contrast as sharply with one another as with any third philosophy you care to mention, beginning with Aristotle's. (p. 46)

Vlastos (1991) lists ten theses, each thesis consisting of a part A and B. Part A specifies a trait of Socrates exhibited only in the late dialogues (L-Socrates), while part B specifies a trait exhibited only in the early dialogues (E-Socrates). The author will enumerate only the theses applicable to the present investigation.

1. A) L-Socrates had a grandiose metaphysical theory of 'separately existing' forms and of a separable soul which learns by 'recollecting' pieces of its pre-natal fund of knowledge.
   B) E-Socrates has no such theory.
2. A) L-Socrates seeks demonstrative knowledge and is confident that he finds it.
   B) E-Socrates, seeking knowledge elenctically, keeps avowing that he has none – 'I know that I don't know'.
3. A) L-Socrates has a complex, tripartite model of the soul.
   B) E-Socrates knows nothing of this model.
4. A) L-Socrates has mastered the mathematical sciences of his time.
   B) E-Socrates professes no interest in these sciences and gives no evidence of expertise in any of them throughout the Elenctic dialogues.

Consequently, if we acknowledge the possibility of distinctive and different philosophies declared alternatively by E-Socrates and L-Socrates, the author would like to specifically consider the third thesis in terms of non-local perceptum.

In "The Republic" (Ferrari, 2000), Plato tells the story of Leontius, son of Aglaeon, to demonstrate the differentiation he makes amongst the rational-element, the desiring-element and the emotional-element. Plato uses this tripartite model to inform his notion of 'master of the self', positing that for the person who is master of himself/herself, the rational-element would necessarily rule over the other two elements. As thesis three indicates, Socrates of the early dialogues posits no such tripartite model of the soul. The question now remains - if Socrates (the author's use of the name Socrates, implies the E-Socrates) were to conceptualize some kind of experiential psychological model, what form would it assume if he were to remain faithful to his declaration of ignorance. Indeed, is such a conceptualization even possible considering the criteria of 'ignorance'? Of course, the Socratic ignorance must be understood in terms of Socrates's famous dictum – 'I know that I don't know'. Such an understanding should accordingly be distinguished from a conceptualization of ignorance professing – 'I know nothing' or 'I don't know'. The difference between the former (Socrates's dictum) and latter declarations of ignorance

is enormously significant if a premise of non-locality is assumed (the significance will become clear as the investigation progresses).

From the premise of locality the development of an experiential model for 'I know that I don't know' presents a paradoxical and essentially contradictory endeavour, but from a premise of non-locality, as the author will demonstrate, it would be logically permissible (non-contradictory). However, the understanding of this logical permissibility requires a re-evaluation of what is generally considered to be logical. This re-evaluation will be based on a subversion of the assumptions of locality (the indicative factors of locality) as enumerated in section 3.2.

Clearly, considering the distinction Vlastos makes, the Socratic model would have to be different to the Platonic model. In context of the dichotomous subject objectification notion expounded earlier (section 4.2 and 4.4) to inform the structure of perception - the rational-element, the desiring element and the emotional element merge into the 'amalgamated relation of the [E]-element and [R]-element' characterized by the *desire* for reciprocated subjectification. As such the rational-element assumes no ruling function (in terms of the master of the self), but rather assists in convoluting physical and emotional needs (desires) through the filter of the dichotomous subject objectifications. From a premise of non-locality the very existence or experience of rationality and emotion reciprocally constructs and necessarily entails desire, as such, through the anthropomorphic dynamics of reciprocated subjectification, Plato's desiring-element dissolves into the amalgamated relation of the [R]-element and the [E]-element.

Non-local perceptum introduces us to the notion of the intuitive-element ([I]-element). The [I]-element is not situated in any one body, but pervades the experience of all bodies – it is non-localized. The [I]-element never rules the amalgamated relationship of the [R]-element and the [E]-element, as it remains wholly undifferentiated from the other two elements - yet it always characterizes and expresses the experiential manifestation of the latter. The [I]-element dissolves into the myriad patterns of rational and emotional experience, yet never deviates from its singular significance for any one localized perception. The [R]-element and [E]-

element perpetually interpret the 'here and there', but the [I]-element never glimpses beyond the 'here'. It is perfectly here.

Accordingly, as can be deduced from the preceding paragraph, the postulated Socratic experiential model is constituted by the [R]-element, the [E]-element, and, importantly, the [I]-element. Please note that the [I]-element does not substitute Plato's desiring element (see earlier discussion).

Of course, by positing the notion of the [I]-element and romanticising the ubiquitous character there-of (the 'here' character there-of), the author is dangerously close to falling prey to the fanciful construction of a possible, yet basically non-substantial objectification. To provide substance for the conceptualization of the [I]-element, and consequently to indicate the validity of the assumption of non-locality, the author will investigate particular non-sensical rational phenomena (irrationalities) that might be considered 'evidence'- clues that implicate non-locality. As first witness the author calls to the stand – 'the problem of self-referential statements'.

It is important to realize that Socrates's dictum is a self-referential statement. Self-referential statements discuss themselves. For example: This sentence has five words. The sentence, in fact, does have five words, so although self-referential, it is true. Also: This sentence has four words. Now this sentence is self-referential and false. It does however become less clear in the following sentence: This sentence is false. It is clearly a self-referential statement, but is it true or false? When we try to decide, we find ourselves stuck in a vicious cycle. The truth or falsity of the statement appears indeterminable.

Consider the 'Barber Paradox': There is a barber in a village that shaves every male villager if and only if the villager does not shave himself. That is clear enough; some villagers shave themselves and some villagers let the barber shave them, but everybody is shaved. The paradox arises when we ask whether the barber shaves himself. If we assume he does, then, since the barber only shaves those who don't shave themselves, the barber can't shave himself. Hence, if he does shave himself, we get stuck in the same circular argument, since the barber shaves everyone who

doesn't shave himself. Hence, if he doesn't shave himself, he necessarily does shave himself. From a premise of locality we are caught in a net of paradox.

In 1902 the British logician and philosopher Bertrand Russel developed a paradox (self-referential) using, in rather extreme form, the same type of very general mathematical set-theoretic reasoning that the mathematicians were beginning to employ in their proofs (Penrose, 1989). Russel's paradox shattered the growing confidence of mathematicians (at the dawn of the twentieth century) by undermining the mathematical reasoning which they believed would ultimately allow for the certain determination of the truth and falsity of any statement. Russel's paradox reads as follows (see Penrose, 1989, p. 100-101 for a detailed explication):
It concerns a set R defined in the following way:

R is the set of all sets which are not members of themselves.

Thus R is a certain collection of sets; and the criterion for a set X to belong to this collection is that the set X is not to be found amongst its own members.

What does it mean to say a set is a member of itself? Consider for example, the set *I* of infinite sets (sets with infinitely many members). Suppose that there are infinitely many different infinite sets, in that case the set *I* is itself infinite. Thus set *I* belongs to itself.
The paradox arises when we ask whether set *R* (as formulated above) is a member of itself or not (self-referential). If it is not a member of itself, then it should belong to *R*, since *R* consists precisely of those sets which are not members of themselves. Thus *R* belongs to *R* after all, hence a contradiction. On the other hand, if *R* is a member of itself, then since 'itself' is actually *R*, it belongs to that set whose members are characterized by not being members of themselves, hence set *R* is paradoxically not a member of itself!

Mathematicians responded to this dilemma by attempting to develop a highly formalized mathematical system of axioms and rules of procedure, the aim being to avoid the paradoxical types of reasoning (like Russel's paradox) and translate all kinds of correct type of reasoning into their scheme. The hope of formal

mathematical systems (the perspective that one can dispense with the meaning of mathematical statements and regard them as nothing but strings of symbols in some formal system) was to place mathematics, once and for all, on an unassailably secure foundation (Penrose, 1989).

The prospect for an impregnable foundation for mathematics was destroyed when in 1931 Kurt Gödel developed a brilliant theorem known today simply as "Godel's theorem". Gödel demonstrated that formal mathematical systems that attempt to avoid contradictive reasoning and is broad enough to contain descriptions of simple arithmetical propositions (example: Fermat's last theorem), must contain statements which are neither provable or disprovable by means allowed within the system. Consequently a valid conjecture that flows from Gödel's theorem is that any formalistic mathematical scheme can't encapsulate the concept of mathematical truth. Penrose (1989) states:

> Gödel's argument shows that the strict formalist viewpoint does not really hold together; yet it does not lead us to a wholly reliable alternative point of view…The procedure that is actually adopted in contemporary mathematics, for avoiding the type of reasoning with 'enormous' sets that leads to Russel's paradox, is not entirely satisfactory. Moreover it is still stated in distinctly formalistic terms- or alternatively, in terms that do not give us full confidence that contradictions can not arise. (p. 101)

Beyond the testimony of paradoxical self-referential statements, there is of course the wave function – recall that the wave function is a mathematical quantity obtained by solving Schrödinger's wave equation that contains all the possible information we can obtain about a quantum system (observed system interacting with an observing/measuring system). The wave function, however, confronts the [R]-element with a paradoxical state of affairs. To illustrate the paradoxical implications of the wave function, Schrodinger (Lockwood, 1989) devised a thought experiment called 'Schrodinger's cat', which reads as follows: A cat is placed in a steel chamber together with a device containing cyanide and radioactive atomic nucleus. When the atomic nucleus decays it emits a particle that triggers a mechanism that releases the cyanide into the steel chamber - consequently the cat is killed immediately. The

question is, without looking inside the chamber, what has happened to the cat – is the cat dead or alive? According to classical physics, the cat is either dead or alive. All we have to do is open the chamber and see which is the case. However, as the author explicated in section 2, the concepts of classical physics break down at subatomic level, and instead we have to rely on the wave function to describe subatomic events (the decay of the radioactive atomic nucleus). The description of the possible states of the system (recall that all the possibilities are related to certain probabilities that change with the passing of time) forms the nucleus of this paradox of Schrodinger's cat (described next).

The time when the radioactive atom decays can, according to quantum mechanics, even in principle, not be predicted exactly. This is a consequence of the nature of the wave function. The moment we close the steel chamber, the wave function describes a quantum superposition of states – this means that the wave function of the system must be composed of two parts, describing both a decayed and an undecayed nucleus. As time goes by the wave function changes and consequently the probability of finding the nucleus in one or the other state changes. After a significant amount of time has passed, the part of the wave function describing the undecayed nucleus will constitute only a small component, while the probability of finding a decayed nucleus will be almost equal to one hundred percent. Now for the interesting and paradoxical part.

The cat is also composed of atoms and should accordingly also be described by a wave function – this would be a very complex wave function, but a wave function nonetheless. Since the fate of the cat is now strongly correlated with that of the radioactive nucleus, these two elements must be described by an entangled state. Therefore the cat's wave function will also unavoidably split into a superposition of two states. This means that before the experimenter looks inside the chamber, there is a certain probability for finding the cat dead, another probability for finding the cat alive, and most importantly, a probability for finding the cat dead and alive! Of course the problem with this is that no one has ever seen a cat being dead and alive simultaneously! The success and accuracy of quantum mechanics forces these indications to be taken seriously.

Is it possible that there really exists such a state of affairs? Schrodinger himself believed otherwise. He argued that the rule of the evolution process of the wave function should not apply to something so large or so complicated as a cat (Penrose, 1989). According to Schrodinger any indeterminacy (example: dead and alive) must be regarded as a feature of the description, rather than of the state of affairs described (Lockwood, 1989). Penrose (1989) disagrees with Schrodinger's view and states that a great many physicists (probably most) would maintain that, on the contrary, there is now much experimental evidence in favour of the evolution of the wave function – and none at all against it – that physicists have no right whatsoever to abandon that type of evolution, even at the scale of the cat.

From a premise of non-locality, the "problem" of self-referential statements, and the "paradox" of Schrodinger's cat, become the "case" of self-referential statements, and the "case" of Schrodinger's cat. The reason for the latter two 'cases' will be discussed in the following paragraphs.

The problem of self-referential statements and the paradox of Schrodinger's cat is essentially the problem of the assumption of locality, specifically indicative factor one as enumerated in section 3.2 – the acceptance of a fundamental here-there/now-then dichotomy. Consider for example paradoxical self-referential statements: the acting subject directs his/her actions towards a him/herself also as an acting subject. These two actions are the same actions yet opposing forms of this action (this idea will later be elaborated in terms of the principle of symmetry in section 6). This dual symmetrical action state is a necessary criterion to differentiate possible paradoxical self-referential statements from singular action or non-symmetrical self-referential statements, for example: 'I know myself' and 'I know that I know'.

The conditioned [R]-element inevitably accepts from a premise of locality and specifically through the medium of language, a fundamental here-there/subject-object foundation. What happens in the case of dual action self-referential statements is that they play along with the rules of the game, in the sense that they assume the form of here-there, for example: 'I know that I know', where 'here' equals 'I know', and 'there' equals the second 'I know'. On the surface everything appears fine, but implicitly the foundation for a possible paradox has already been laid. The active

subject has directed its actions to itself as active subject, and in the process become its own object. Thus, although the subject-object structure/the here-there rationale has been accepted, the content specifically signifies a 'subject-subject' structure, a 'here-here' format. The 'here' is a 'here', but the 'there' is also a 'here', stated otherwise, the 'acting subject' is the 'acting subject', but the 'object' is also the 'acting subject'. Of course this presents no problem for self-referential statements if the acting subject corresponds with the other acting subject, the subject-object structure is allowed to make sense, for example: 'I know that I know'. However, the covert contradiction becomes overt if the alternating 'acting subjects' do not correspond, as would be the case with – 'I know that I don't know'. In such cases the subject-object rationale becomes problematic, the locality assumption of 'here-there' breaks down. It degenerates into an ad infinitum self-perpetuating circular argument.

The paradox essentially lies in the same subject performing two similar yet opposing actions at exactly the same time. For symmetry based on the [R]-element this is contradictory, but for symmetry based on the [I]-element this is precisely sensical (the latter proposition will be explained in detail in section 6). If the barber was allowed to cut his hair now and later not cut his hair, there would be no problem, or alternatively, if Socrates could *know* now and later *not know*, there would be no contradiction. But the simultaneity criterion, forced upon the 'here-there' structure by the 'here-here' content, at least questions, if nothing else, the assumption of locality as premise.

The possible fallaciousness of the assumption of locality must also be evaluated in terms of Schrodinger's cat. It is problematic for a conditioned [R]-element to consider in terms of its dichotomous temporal and spatial assumptions the state of a simultaneously dead and alive cat. As was the case for paradoxical self-referential statements, the here-there/now-then structure breaks down. Once again, it would be acceptable for the cat to be alive now and dead later, but wholly unacceptable in a dichotomous spatio-temporal framework for the cat to be simultaneously alive and dead. Similarly, it was paradoxical for the single photon to pass through two different slits at once in the two-slit experiment, but that is exactly what the inferential pattern on the plate (empirical experiment results) forced the assumption of locality to confess. Consequently, it is quite possible that the experimental indications of

quantum mechanics are not dubious, but indeed that it is our fundamental assumptions concerning the nature of reality and the character of our own existence that are dubious. The latter possibility does not imply that Schrodinger's cat truly exists in a state of being dead *and* alive, it does however acknowledge that logic that is delimited to spatio-temporal dichotomies, fails to describe the evolution of certain physical systems (like for example the two slit experiment). As such one might extrapolate and state that manifesting localized phenomena do not necessarily equate some exclusive ontological base. In context of this thesis this amounts to saying that the conditioned [R]-element does not appear to occupy a prototypical form of experience.

The 'case' of self-referential statements (linguistic and mathematical) *implicate* non-locality as a more suitable candidate to occupy the position of base assumption. The latter *implication* assumes an essentially logical character and will be elaborated subsequently.
The 'case' of Schrodinger's cat, considered in light of the two-slit experiment and Bell's theorem, also corroborates the *implication* of non-locality. Now, however, the *implication* assumes an essentially practical character informed by empirical experiments.

Consider also, in questioning the ontology or exclusivity of locality, exhibit A – the principle of relativity, and exhibit B – Zeno's paradox. Exhibit A: The principle of relativity was the starting point of Albert Einstein's special theory of relativity (as distinguished from his later 'general theory of relativity'). Relativity theory demonstrates that all measurements involving space and time lose their absolute significance and that the classical concepts of an absolute space and an absolute time are superfluous (Capra, 1999). Sixty-four years after Einstein first conceptualized his special theory of relativity, Sachs (1969) in 'Physics Today' wrote:

> The real revolution that came with Einstein's theory … was the abandonment of the idea that the space-time co-ordinate system has objective significance as a separate physical entity. Instead of this idea, relativity theory implies that the space and time coordinates are only the elements of a language that is used by an observer to describe his environment. (p. 53)

Important to note is that the special theory of relativity is not a theory positing that everything is relative. Zukav (1991) states that fundamentally the special theory of relativity is not about what is relative, but rather about what is absolute. Regarding the latter consider the following: in relativistic physics time is added to the three space coordinates (breadth, length, and height) as a fourth dimension. Space and time are no longer considered to be separate entities, but are intimately and inseparably connected to form a four-dimensional continuum called the 'space-time continuum' (Capra, 1999). As such the special theory of relativity gives rise to a phenomenon well known to physicists, called the *twin paradox*. One twin remains on earth while the other twin flies away in a spaceship at a speed approaching the speed of light. According to relativistic physics, when the twin in the spaceship returns a few years later he will be younger then the twin that remained on the earth (Hawking, 2001). The point is the following: the special theory of relativity holds that there is a definite space-time interval that allows for movement of the two twins to be correlated. From their own individual frame of reference the twins will record different times and distances in relation to each other, yet the special theory of relativity allows for the two different sets of data to be transposed to the other's frame of reference (the latter is often referred to as Lorentz invariance and will be explained in section 6.3). The final numbers would come out the same for both the twins (Zukav, 1991). However, from a premise of non-locality even this absolute relation must be considered in terms of an epiphenomenon. Implicit to the principle of relativity is the assumption of locality in the form of indicative factor one (see section 3.2) – the primacy of here-there/now-then. Therefore the special theory relativity, including the real physically changing bodies, describes a particular pattern of localized 'movement'. Exhibit A, if nothing else, clearly indicates the illusory appearances that localized (spatio-temporal) phenomena can assume.

Exhibit B: Zeno's paradox. The ancient Greek philosopher Zeno believed that our senses could not be trusted, and specifically argued that the basic experience of motion is an illusion. By utilizing an apparent inconsistency in what everyday experience indicates to be true and what logic dictates must be true, he developed the following argument known to this day as *Zeno's paradox* (Pine, 1988): To move from any point A to another point B a person must first travel half the distance. To move from this halfway point to point B, again half the distance must be traversed.

To move from any subsequent point to point B, again half the distance must be traversed. No matter how close point B is approached, there will still be some distance left, and the next half of the distance must be travelled again, and again, and again, ad infinitum. Since point B can be any distance, including a very short distance, it is logically impossible to traverse even the shortest distance! A person might experience the self and others moving about from point to point everyday, but careful logical inspection, according to Zeno, reveals such movement to be an illusion. Zeno believed that we should follow the logical guide of our reason, no matter how strange the result. If the above paradox is problematic, it is so because the movement that traverses the distance between A and B acknowledges only the distinctness of A and B and not the identicalness of A and B. From a premise of non-locality all exclusively dichotomous relation must be considered a consequence of localized conditioning, such relation of course not being encompassed by the capacity for objectification (lower animals also experience the world in a relational manner without the desire for reciprocated subjectification related to non-imitation/non-mirror-self-recognition), but succinctly expressed thereby. There-fore, in consideration of factor 8 in section 3.2, the relation between A and B must acknowledge the differentness, but also the identicalness of A and B due to the [I]-element and the principle of symmetry (explained in section 6). All localized logic, in order to be able to describe the simple movement from point A to point B, must also include the extra option of 'A and B' that is essential for making sense of the movement from A to B. When Zeno says that one must initially traverse half of the distance between A and B, point A remains the same, point B remains the same, yet the extra option 'A and B' is now changed to 'half A and B'. 'Half A and B' does not equal 'A and B', and because 'A and B' is the logical requirement from a premise of non-locality to traverse the distance between A and B, 'half A and B' will never logically be able to traverse the distance between A and B, it will logically only be able to initially traverse half the distance between A and B (consequently also half the distances between the new point and B). The nature of non-local perceptum explicating the latter will be further considered in section 5.3 and section 6.

If a premise of non-locality is assumed, a fundamental implication is the non-exclusive state of any here-there/now-then dichotomy. If, as such, no exclusivity was

attributed to the experience of this spatio-temporal dichotomy, the experience there-of might equally well be described as illusory.

Furthermore, regard also the occurrence of what mathematicians call 'real' numbers. Real numbers are numbers that can be represented as infinite decimal expansions, such as:

$$5.789345346797\ldots \text{ or } -359.677647823681\ldots$$

The Russian-German mathematician Georg Cantor demonstrated, through what became known as *Cantor's diagonal slash argument*, that real numbers are, in fact, uncountable (Penrose, 1989). This means the number of real numbers are greater than the number of rational numbers (rational numbers include all numbers that have repeated or finite decimal expansion). Real numbers proliferate ad infinitum, and when interpreted in terms of distance or time (or describing distance or time) mathematicians encounter scales so small that the concepts of distance or time, in the ordinary sense, cease to have meaning. Real numbers refer to a mathematical idealization rather than to any actual physically objective quantity (Penrose, 1989). Again, as with Zeno's paradox, any logical system (such as the numerical system) based fundamentally on the differentiation of its constitutive elements (different numbers in this case), inevitably produce infinity considerations as a consequence of the premise of locality.

Thus, real numbers and Zeno's paradox describe realities completely foreign to our everyday localized experience. Again, if nothing else, the premise of locality engenders a multitude of irreconcilable questions and paradoxical implications. From a premise of non-locality, the latter are not problems, but solutions on to themselves (see also section 5.3).

In light of the above dialectic, how is one to understand Socrates' particular flavour of ignorance in context of non-locality? Is the tripartite model consisting of the [R]-element, the [E]-element, and the [I]-element logically coherent in terms of the non-locality interpretation of Socratic ignorance?

If one is to assume a premise of locality and adopt a Platonic tripartite model, Socrates's ignorance becomes contradictory (see Vlastos thesis 3 enumerated earlier) and the [R]-element ipso facto relegates Socrates's self-referential dictum to the realm of non-sensical and amusing paradoxes (as expounded earlier). However, if one is to accept a premise of non-locality, Socratic ignorance becomes infused with novel meaning and his infamous dictum bespeaks a new and wondrous realm of unchartered knowledge. The primacy of the [I]-element (related to S – S) buffers 'I know that I don't know' against a paradoxical fate, and acknowledges, indeed requires, that Socrates can know and not know at exactly the same time! Recall the "Schrodinger's cat" experiment - before the experimenter looks inside of the chamber, the state of the cat becomes entangled to the state of the radioactive atomic nucleus, accordingly the cat can be said to be alive, or dead, or dead and alive. The cat exists in a state of quantum superposition (dead and alive) until the experimenter looks inside the chamber (makes a measurement), only then does the wave function 'collapse', and the experimenter finds either a dead cat or an alive cat. Analogously the same applies to the Socratic 'elenchus', before Socrates investigates the truth or falsity of a belief or proposition, or stated otherwise, before Socrates investigates whether the interlocutor knows or does not know, the interlocutor's state of knowledge can be considered to be entangled with the Socratic state of 'I know that I don't know' (as the state of the cat becomes entangled to the state of the radioactive atomic nucleus). As such Socrates and the interlocutor adopt the role of the experimenter, with the dialectical investigation (the elenchus) comparatively symbolising the experimenter looking inside the chamber. One might consider the superposed state of 'knowing and not knowing' to collapse as the elenchus investigation proceeds – either the interlocutor knows or does not know. In either case, knowing or not knowing can only be determined by investigating the proposition (looking inside the chamber), but importantly, the state of 'knowing and not knowing' must form an integral part of the logic underlying the dialectical investigation.

An important difference, however, between Schrodinger's cat and the Socratic elenchus is that whereas the cat exists only in a superposition of two states (dead and alive), Socrates and the interlocutor have multifarious beliefs and opinions, each of which can be formulated in terms of a particular dichotomous subject objectification. Objectifications equate what a person thinks he/she knows or does not know (see

earlier discussion – section 4.2). The investigation of the state of knowledge of the interlocutor consequently becomes entangled by way of the superpositioning of a multitude of objectifications, multifarious superposed 'knowings' and 'not knowings'. No wonder the elenchus of the early Socratic dialogues usually ended up in confusion or *aporia*[3].

The latter understanding requires a re-evaluation of the notion that for Socrates the discovery of ignorance was the beginning and not the end of the philosophical task (Tarnas, 1991). The [I]-element engenders that it would be fallacious to suppose that once one has discovered a particular ignorance, or discovered that one is ignorant in general, that this would serve as a foundation whence a spatio-temporal dichotomous edifice of certain and true knowledge can be constructed. Such a supposition would only serve to enthrone the [R]-element (relate to *the brilliant Greek mistake*), to confer a sense of exclusivity to the experience of locality and the conditioned nature of rationality. Rather the [I]-element dictates a form of logic allowing states of knowing, states of not knowing, and, importantly, states of 'knowing and not knowing'. Thus ignorance and knowledge are different sides of the same coin that with every toss has a definite probability of landing vertically (on its rim).

The above disquisition proffers a Socratic interpretation of non-local perceptum, and entails a re-evaluation of the character and scope of logic in context of the postulated non-exclusive state of spatio-temporal localized phenomena.

[3] Aporia is a Latin word derived from the Greek word 'aporos' – meaning 'impassable'.

Section 5

5. Absolute power states

5. 1 Juxtaposed Foucault

Absolute power states refer to discontinuous manifesting spatio-temporal circular states (the choice of the term 'circular' is related to the perfect reflective symmetry/invariance of a sphere and will be explained in section 6) which biological cognition experiences/interprets as repetitive patterns of locality movement. Absolute power states acknowledge the possibility of the non-exclusivity of spatio-temporal dichotomies and so dictate that all localized form can be considered to participate in a fundamental and instantaneous connectedness. As such the miniscule quark and the awesome quasar are inextricably intertwined, the singular ant and the masses of man siamese patterns of a transparent plinth, the primordial and the postremordial[4] forever united in an omnipresent now. Such subversion of here-there/now-then assumptions, preclude absolute power states from describing the interactions of localized phenomena as original or causal – no exclusively dichotomous relation constitutes the character of absolute power states. Hence the word 'absolute power states' is used as opposed to 'absolute power relations', specifically to avoid such confusion.

Absolute power states are the dynamic function of non-local perceptum manifesting as locality. Localized form of non-local perceptum implies a perspective that only exists as another perspective. These perspectives inform localized bodies which become entangled to configure illusory patterns of movement and experience. The healthy human cognition interprets these manifesting patterns as dichotomous subject objectifications, as such absolute power states assume inter-subjective relational significance. The latter formulation consequently extends the Gestalt psychology principle of the 'mind that constructs spatial wholes' in the following manner: non-local perceptum emanates as localized form by constructing spatial *and temporal wholes*. To be sure, continuous time and space, from the premise of non-locality, will be interpreted as knotted relations that infinitely 'happen' or 'occur' together as

[4] Postumordial is a word devised by the author derived from the Latin superlative postremus - a – um, meaning 'hindmost' or 'last'; Postremordial means – 'existing from the end of time' – the converse of primordial.

juxtaposed epiphenomena. As such the boundaries of a space-time-continuum do not extend beyond the relational experience there-of, which, through its dichotomous relational construction, is delimited as to its ontological significance.

To reiterate: absolute power states might be understood as manifesting spatio-temporal-circular states that conglomerate discontinuously ('discontinuously' here does not imply successive moments or states, but rather the same moment happening as different moments) to collapse as locality states experienced/interpreted relationally as to continuous space and time. Possible scientific mechanics underpinning absolute power states will be considered in section 5.3.

Absolute power states further acknowledge the depths of the conditioned [R]-element, in the sense that even the physical body represents a form of conditioning and so does not inhabit an ontological base. This principle is illustrated by an experiment conducted in 1972 by Hafele and Keating (Zukav, 1991). Four of the most accurate atomic clocks available were put aboard an aircraft and flown around the world (alternatively east and west). At the end of the trip, they were found to be slightly behind their stationary, earthbound counterparts with which they were synchronized before the flight. Thus, proportional to their velocities relative to each other, the physical clocks (physical body) appeared to be subjected to relative time frames. This experiment correlates with the twin paradox explicated earlier, where the physical age of the biological bodies of the twins differed according to their velocities relative to each other. Hence even the physical body equates a form of spatio-temporal relational conditioning, locality conditioning, basically the contingent character of the [R]-element (please note that the preceding description does not equate absolute power states with Einstein's relativity, it merely supposes that there is some underlying character of being that allows for this temporal anomaly).

This section will focus on the biological body experiencing the desire for reciprocated subjectification that becomes encoded as dichotomous subject objectifications that simultaneously relationally interpret and influence configurations of absolute power states. Absolute power states will inform the character of objectifications (and consequently itself be informed) through correlation, specifically not equation, of objectification with Michel Foucault's formulation of power.

Gordon (1980) writes that Foucault insists on "the use of the concept of power in a relational rather than a substantiating mode" (p. 245). Power for Foucault is not an omnipotent causal principle or shaping spirit, but a perspective concept, a practice that establishes certain relationships between heterogeneous elements. In "History of Sexuality: Volume 1" Foucault states that power must not be regarded a group of institutions and mechanisms that ensure the subservience of the citizens of a given state. Also it must not be considered a mode of subjugation which, in contrast to violence, has the form of the rule. Neither must power be interpreted as a general system of domination exerted by one group over another, a system whose effects, through successive derivations, pervade the entire social body. Accordingly, the sovereignty of the state, the form of law, or the overall unity of domination must not be considered as a priori forms of power. In Foucault's (1976/1998) own words:

> It seems to me that power must be understood in the first instance as a multiplicity of force relations immanent in the sphere in which they operate and which constitute their own organization; as the process which, through ceaseless struggles and confrontations, transforms, strengthens, or reverses them; as the support which these force relations find in one another, thus forming a chain or a system, or on the contrary, the disjunctions and contradictions which isolate them from one another … (p. 92)

Implementing his conceptualization of power-relations as a methodological instrument to analyse power, Foucault characterizes, in two lectures delivered in 1976, two predominant forms of power, namely: the juridical-political theory of sovereignty (sovereign power) and disciplinary power.

Foucault portrays sovereign power by identifying a common point between the judicial conceptualization of power (also designated liberal conceptualization of power), and the Marxist conceptualization of power (a certain conception of power that might be held by Marxists). This common point Foucault calls an economism in the theory of power. The reasons for this Foucault explains as follows: in classic judicial theory power is taken to be a right, which one is able to possess like a *commodity*, and which one can in consequence wholly/partially transfer or alienate

through a legal act or some act that establishes a right, such as takes place through cession or contract. As such juridical theory is essentially based on the idea that the constitution of political power obeys the model of a legal *transaction* involving a *contractual type of exchange*. In the Marxist conception, power is conceived primarily in terms of the role it plays in the maintenance simultaneously of the *relations of production* and of class domination which the development and specific forms of the *forces of production* have rendered possible. In this case then, the historical *raison d' étre* of political power is to be found in the economy. This sovereign power with its correlating economic emphasis, formulates power as an original right that is given up in the establishment of sovereignty, and the contract, as matrix of political power, which bilaterally provide its points of articulation. Whenever such a power goes beyond the terms of the contract, it risks becoming oppression. Therefore this sovereign power (a type of contract power) has oppression as its limit, or more specifically, the transgression of this limit. Accordingly Foucault describes this power in terms of a contract-oppression schema.

The conceptualization of disciplinary power is the end product of Foucault's development of a methodology which allows for a non-economic analysis of power. A non-economic analysis of power reveals two solid hypotheses to characterize power. The first of these Foucault designates the repression-hypothesis (Reich's hypothesis). This hypothesis holds that power is basically that which represses - power represses nature, the instincts, a class, individuals. Such a description of power as repression is a notion evinced in the discourse of intelligentsia like Hegel, Freud, and later Reich (Foucault, 1976/1980). The second hypothesis Foucault calls Nietzsche's hypothesis. This hypothesis posits that power should be analysed primarily in terms of struggle, conflict and war. As such this hypothesis argues that the basis of the relationship of power lies in the hostile engagement of forces.

Foucault links these two hypotheses in the following way: repression can be seen as the political consequence of war, somewhat as oppression, in the juridical-political theory of sovereignty, was seen as the abuse of sovereignty in the juridical order. Important to note, this repression is not abuse, but is, on the contrary, the mere effect and continuation of a relation of domination. Consequently these hypotheses are synthesized into the domination-repression, or war-repression schema. Concerning

the latter schema, the pertinent opposition is not between the legitimate and the illegitimate, as in the first schema, but between struggle and submission. As such the domination-repression schema is nucleic to the conceptualization of disciplinary power.

According to Foucault (1976/1980) the disciplinary form of power emerged, or rather was invented, during the course of the seventeenth and eighteenth centuries (the nature of this 'invention' will be discussed in 5.2 and serve as a descriptive exemplar for the character of S – S: O). Foucault (1976/1980) elucidates this disciplinary power as follows:

> This new mechanism of power is more dependent upon bodies and what they do than upon the Earth and its products. It is a mechanism of power which permits time and labour, rather than wealth and commodities, to be extracted from bodies. It is a type of power which is constantly exercised by means of surveillance rather than in a discontinuous manner by means of a system of levies or obligations distributed over time. It presupposes a tightly knit grid of material coercions rather than the physical existence of a sovereign. (p. 104)

The notion of disciplinary power is further informed by what Foucault calls "a micro-physics of power" (Foucault, 1975/1977, p. 26). This refers to the political investment in the body in accordance with complex relations. It is largely as a force of production that the body is invested with relations of power and domination, however, the bodies constitution as labour power is possible only if it is caught up in a system of subjection. As such the body is considered useful only if it is both a productive body and a subjected body. Foucault explains that this micro-physics of power presupposes that the power exercised on the body is conceived not as a property, but as a strategy, that its effects of domination are attributed not to 'appropriation', but to dispositions, manoeuvres, tactics, techniques and functionings. The model of this microphysics resembles a perpetual battle rather than a contract regulating a transaction, it should be deciphered in a network of relations, constantly in tension, in activity, rather than a privilege that one might possess.

Foucault (1976/1980) postulates that modern society, from the nineteenth century onward has been characterized by the simultaneous exercise of power through the heterogeneity of the sovereign mode and disciplinary mode. According to Foucault, since the nineteenth century, the contract-oppression schema (sovereign power) has been superimposed on the domination-repression schema (the mechanisms of discipline, disciplinary power), in such a way as to conceal the actual procedures of disciplinary power, the actual elements of domination inherent in its techniques. Foucault further posits that the juridical systems have enabled sovereignty to be democratised through the constitution of a public right articulated upon collective sovereignty, while at the same time this democratisation of sovereignty was fundamentally determined by and grounded in mechanisms of disciplinary coercion.

The preceding discourse regarding Foucault's formulation of power will provide the elucidating framework whence a specific dynamic of objectification will be explicated as to its capillary details and function. The Foucaultian power conceptualization correlates with the secondary field of objectification expositioned in section 4.4. Objectifications, in general, equate the psycho-physiological interpretation of the 'moving' physical world, it represents what a person consciously or unconsciously 'knows', expects or projects in relation to other bodies. Basically objectifications subsume any form of activation or experience of the [R]-element that evinces cognisance of the self as subject on toward the external world, any biological cognitive state that can fathom the ephemeral status of the physical body, that on some level realizes that its experience as physicality will end (humans are by no means necessarily the only species that possess this capacity). Objectifications can readily be correlated with knowledge, knowledge of knowledges (be they ignorant or knowing knowledges), power, and knowledge of power. Of course, in context of this thesis, these knowledges, these powers, these modes of being, revolve and configure around the spill of the desire for reciprocated subjectification.

Consider, regarding objectification on toward power, Alfred Adler's explication of the overall motivation of mankind. Adler regards the striving for superiority as innate and universal to all organisms (Adler, 1930). Adler expresses the pertinence of this notion for the human psyche as follows:

> I began to see clearly in every psychological phenomenon the striving for superiority. It runs parallel to physical growth and is an intrinsic necessity of life itself. It lies at the root of all solutions to life's problems and is manifested in the way in which we meet these problems. *All our functions* [italics added] follow this end. (p. 398)

According to Adler, this striving for superiority manifests itself in two ways, namely as a striving for power and social interests (Adler, 1930; Adler, 1938). Therefore an Adlerian exposition of the human psyche would characterize the perceptive world of the localized individual ("*all our functions"*) as geared towards satisfying this striving for power. Whereas Adler's theory ascribes a sense of genesis to this striving for power, the striving for power can be considered, in context of the premise of non-locality, a specific dynamic born from the desire of reciprocated subjectification. This desire, characteristic of dichotomous subject objectifications, remains firmly rooted in the field of locality and must therefore be regarded as a derivatory form of experience. No ontological exclusivity is accordingly granted to the striving for power, no inescapable innate and universal character need be imposed on this 'will to power'.

The desire of reciprocated subjectification imbues objectifications with 'power' significance and allows for the succinct correlation of the secondary field of objectification and Foucault's conceptualization of power. This correlation is also supported by Foucault's description of the interdependent state of power and knowledge. Foucault (1975/1977) asserts that power and knowledge directly imply one another; that there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations. He states that the whole tradition that places knowledge in a disparate domain beyond the injunctions, interests and demands of power relations, should be abandoned. Foucault bespeaks 'power-knowledge relations', where the subject who knows, the objects to be known and the modalities of knowledge must be regarded as multifarious effects of the fundamental implications of power-knowledge and their historical transformations.

A possible pattern of absolute power states broadly in terms of the secondary field of objectifications, cohesively in terms of the interactive configurations of leaf- and

stem-objectifications, specifically in terms of disciplinary power, will be investigated in the next section.

5. 2 A panoptic objectification

Dichotomous subject objectifications have an omnipresent breath that does not entangle locality by means of a descending net of invincible unity, but rather these objectifications are produced from one moment to the next, at every capable cognitive point, proliferating in every relation from one mobility to the other. As such S – S: O represent concatenating patterns articulated upon and through manifesting states of locality – absolute power states. This section will investigate the contracting, expanding, proliferating morphology of objectifications. Objectification will be examined in terms of the appearance of the panopticon at the end of the eighteenth century, and the subsequent spread of the Panopticon principle throughout societal mechanisms and structures. Michel Foucault's book "Discipline and Punish" will serve as reference source unless indicated otherwise.

The panopticon (conceptualized by Jeremy Bentham) is an annular (ring-shaped) building in the middle of which there is a yard with a tower at the centre. This tower is pierced with wide windows that open onto the inner side of the ring; the peripheric building is divided into cells, each of which extends the whole width of the building; they have two windows, one on the inside, corresponding to the windows of the tower; the other, on the outside, allowing the light to cross the cell from one end to the other. In the central tower there is an observer. Since each cell faces both the inside and the outside, the observer's gaze can traverse the whole cell. Through the effect of backlighting there is no dimly lit space, so the small captive shadows in the cells of the periphery are constantly exposed to the gaze of the observer who watches through shuttered windows or spy holes in such a way as to be able to see everything without anyone being able to see him/her. The particular arrangement of spatial unities by the panoptic mechanism make it possible to see constantly and to recognize immediately. Each inmate, in his/her place, is securely confined to a cell from where he/she is seen from the front by the observer, yet prevented by sidewalls from coming into contact with his/her fellow inmates. The inmate is seen, but he/she does not see; he/she is the

object of information, never a subject in communication. The arrangement of his/her room imposes on the inmate an axial visibility, but the division of separated cells imply a lateral invisibility. This invisibility facilitates order.

According to Foucault the major effect of the panopticon is the following: to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power, to achieve a spatial arrangement where surveillance is permanent in its effects, even if it is discontinuous in its action; to create through this architectural apparatus a sustained power relation independent of the person who exercises it. Basically, that the inmates should be caught up in a power situation of which they themselves are the bearers. Foucault explains that Bentham laid down the principle that power should be visible and unverifiable. Visible: the central tower from which the inmate is spied upon must constantly be in his/her field of sight. Unverifiable: the inmate must be ambiguous as to whether he/she is being looked at at any one moment, the high probability that he/she is currently being observed must be ever present for the inmate. To this end the central tower must have Venetian blinds or a spy hole in order to make the presence or absence of the observer unverifiable.

The panopticon makes it possible to perfect the exercise of power. It does so in several ways: it reduces the number of those who exercise it, while increasing the number of those on whom it is exercised; the constant pressure of the omnipresent gaze acts even before the offences, mistakes or crimes have been committed; without any physical instrument other than architecture and geometry, it acts directly on individuals. The panopticon assures an effective application of material, personnel and time.

The architectural figure and functions of the panopticon can be characterised as specific leaf-objectifications, as particular operations of dichotomous subject formation (S – S: O) - for example: the prisoner on toward the observing guards (and vice versa), the prisoner on toward the building or his/her cell, prisoners on toward each other, the prisoner on toward his/her sentence and crime. But the panopticon must be understood as more than a mere dream prison filled with criminals: it is a diagram of a mechanism of power reduced to its ideal form, it is in fact a figure of

political technology that may and must be detached from any specific use. Foucault (1977/1980) says that whereas the palace and the church were architectural forms manifesting might, the Sovereign, or God, the panopticon utilizes "the disposition of space for economico-political ends" (p. 148). The panopticon allows for a fictitious relation to mechanically give birth to a real subjection. The latter principle *informs* the network of leaf-objectifications that construct the panopticon experience *with* a thematic stem-objectification that may be formulated as follows: a person who is subjected to a field of visibility, and who knows it, assumes responsibility for the constraints of power, he/she allows invisible subjection to play spontaneously upon the self; he/she inscribes in him/herself the power relation in which he/she simultaneously plays both roles; the person becomes the principle of his/her own subjection – the self on toward an invisible and omnipresent imperative.

This stem-objectification provides the underlying dynamic matrix where-upon multifarious, yet intricately related leaf-objectifications are interpreted, constructed and articulated. Take for example the following leaf-objectifications: the panopticon institution is functionally applicable to hospitals, schools, workshops, factories, barracks, and of course, prisons (Foucault, 1973/2000). The stem-objectification is polyvalent in functionalising these leaf-objectifications: it serves to reform prisoners, but also to treat patients, to instruct children, to confine and observe the insane, to supervise workers, to put beggars and idlers to work, and to inspect soldiers. As such a madman, a patient, a condemned man, a worker or a schoolboy might occupy the cells in the peripheral building. So the observer becomes a controlling and dominating subject, on toward the observed that adopts a dominated, controlled and subjugated subject position (represents an exemplar of the desire for reciprocated subjectification that becomes encoded as to a particular dichotomous subject objectification).

The stem-objectification as formulated above equates the notion of 'panopticism'. Bentham dreamt of transforming the capillary relations of the panopticon into a network of mechanisms that would permeate society as a whole without interruption in space or time. Foucault states that the panoptic schema, without disappearing as such or losing any of its properties, was destined to spread throughout the social body and that its vocation was to become a generalized function. This generalized function

that would pervade societal mechanisms is essentially expressed by the idea of panopticism. Foucault (1973/2000) describes panopticism as follows:

> Panopticism is one of the characteristic traits of our society. It is a type of power that is applied to individuals in the form of continuous individual supervision, in the form of control, punishment, and compensation, and in the form of correction, that is the molding and transformation of individuals in terms of certain norms. This threefold aspect of panopticism – supervision, control, correction – seems to be a fundamental and characteristic dimension of the power relations that exist in our society. (p. 70)

Panopticism is the general principle of a covert politics whose object and end are not the relations of sovereignty, but the relations of discipline. These relations of discipline portray a specific configuration of dichotomous subject objectifications.

The disciplinary mechanism of the panoptic schema not only lead to an increase in disciplinary establishments, but also became "de-institutionalised" (Foucault, 1975/1977, p. 211), that is, the relations of discipline emerged from the closed institutions in which they once functioned and began to circulate in a 'free' state (panopticism). Consider for example the dissemination of centres of observation throughout society. Religious groups and charity organizations had long played this role of *disciplining* the population. They divided territory into quarters and cantons, and the members of the association divided themselves up along the same lines. Foucault writes that from the Counter-Reformation to the philanthropy of the July monarchy, initiatives of this type continued to increase. They had multifarious aims, for example: religious (conversion and moralization), economic (aid and encouragement to work), and political (the struggle against discontent and agitation).

Disciplinary mechanisms not only took responsibility for the particular function it exercised over individuals, but also for the individual's existence as a whole (Foucault, 1973/2000). Consider the following: *hospitals*, which were designed for healing, forbade sexual behaviour, sexual activity; in *schools* pupils weren't just taught to read, but also obliged to wash. Furthermore these closed apparatuses added to their internal functioning a role of external surveillance, developing around

themselves a whole margin of lateral controls. For example: the Christian School must not simply train docile children; it must also make it possible to supervise the parents, to gain information about their daily lives, their resources, their piety, their monetary status, their morals.

Social discipline soon became the function of the police apparatus. Although the police as an institution were certainly organized in the form of a state apparatus, as Foucault acknowledges, and although as such it was certainly linked to the centre of political sovereignty, the type of power that it exercises, the mechanisms it operates and the elements to which it applies them are specific. In disciplinary power, police power must bear over everything, not as the totality of the state, nor of the kingdom as visible and invisible body of the monarch, but rather as an instrument of permanent, exhaustive, omnipresent surveillance capable of making all visible, as long as it could itself remain invisible (recall the Panopticon relation of the invisible observer on toward the visible prisoner). The police apparatus, extending its function through corroboration with secret agents, paid informers, and prostitutes, acted like a faceless gaze that transformed the whole social body into a field of perception: thousands of eyes posted everywhere, mobile attentions ever on the alert, a multitude of fictional central towers permeating the social network.
Foucault (1975/1977) explains as follows:

> On the whole therefore, one can speak of the formation of a disciplinary society in this movement that stretches from the enclosed disciplines, … to an indefinitely generalizable mechanism of 'panopticism'. Not because the disciplinary modality of power has replaced all the others (example Sovereign power), but because it has infiltrated the others… (p. 216)

Accordingly one might synoptically assess disciplinary power (a specific form of stem-objectification) as follows: it must not be identified with an institution or with an apparatus; it is a type of power relation, a technology, a modality for its exercise, comprising a whole set of instruments, techniques, procedures, levels of application, and targets. Foucault (1975/1977) explicates that it may be taken over either by *specialized* institutions (the penitentiaries of the nineteenth century), or by institutions that use it as an essential instrument for a particular end (schools, hospitals), or by

pre-existing authorities that find in it a means of reinforcing or reorganizing their internal mechanisms of power (intra-familial relations – the parent-child cell), or by apparatuses that have made discipline their principle of internal functioning (the disciplinarization of the administrative apparatus from the Napoleonic period), or finally, by the state apparatuses whose major, if not exclusive, function is to assure that discipline reigns over society as a whole (the police).

Julius (cited in Foucault, 1975/1977) speaks of panopticism and says that the panopticon was much more than architectural ingenuity, he describes it as an event in the 'history of the human mind'. On the surface the panoptic principle appears merely as a solution to a technical problem, but through it a whole type of society emerges. The influence of such a stem-objectification (disciplinary power; panopticism) on general societal transformations is expounded by Foucault as follows: historical patterns of societal mechanisms evinces the conjunction of, on the one hand, the monarchical, ritual exercise of sovereignty, and on the other, the hierarchical, permanent exercise of indefinite discipline; simply put - the interplay of sovereign power (contract-oppression) and disciplinary power (domination-repression; as discussed in section 5.1). During the eighteenth century the establishment of an explicit, coded and formally egalitarian juridical framework (related to sovereign power), which was made possible by the organization of a parliamentary, representative régime, masked the process whereby the bourgeoisie became the political dominant class. This process was facilitated by the clandestine operations of disciplinary mechanisms. These disciplinary mechanisms, characterized by tiny, everyday, physical mechanisms, by all those systems of micro-power that are essentially *non-egalitarian* and *asymmetrical*, supported the general juridical form that guaranteed a system of rights that were *egalitarian* in principle. Thus a contradictory and heterogeneous interplay of power arose where, in a democratic fashion, the will of all form the fundamental authority of sovereignty, but the disciplines provide at the base, a guarantee of the submission of forces and bodies. Panopticism bellied the 'contract' which was regarded as the ideal foundation of law and political power - real corporal disciplines constituted the foundation of the formal, juridical liberties.

According to Foucault (1975/1977) the disciplines should be regarded as a type of "counter-law" (p. 222). They function as to produce insurmountable asymmetries and exclude reciprocities. Conversely, whereas the juridical systems define juridical subjects according to universal rules, the disciplines "characterize, classify, specialize; they distribute along a scale, along a norm, hierarchize individuals in relation to one another and, if necessary, disqualify and invalidate" (p. 223). Disciplinary power effects a suspension of the law that is never total, but is never annulled either. The exercise of power appears to be delimited by the universal juridicism of modern society, yet its universally widespread panopticism enables it to operate, on the dark side of the law, a 'machinery that is both immense and minute', which supports, reinforces, multiplies the asymmetries of power. So the limits drawn around the law are compromised. The fundamental disparity between disciplinary power and sovereign power, two heterogeneous and divergent objectifications, will be revisited in section 6 and conceptualized in terms of a type of *cognitive dissonance*.

The dynamics of absolute power states allow for a pattern of the secondary field of objectification to be described. The reciprocal interplay of leaf-objectifications and stem-objectifications have traced a path from the architectural figure of the panopticon, through the individual institutions such as hospitals, schools and factories, delineating into governmental control procedures and mechanisms, ultimately effecting broad juridico-economical transformations in modern society. These power-relation patterns (in terms of the premise of non-locality) must not be regarded as some univocal outside force imposing itself on the totality of individual minds, rather these dichotomous subject objectifications are produced from one moment to the next as interactive perspectives converging into the experience of the self as subject. Always related to, and always confronting the desire of reciprocated subjectification that animates the objectification experience.

Foucault (1975/1977) asks the question, "Is it surprising that prisons resemble factories, schools, barracks, hospitals, which all resemble prisons?" (p. 228). From the perspective of leaf-objectifications it is very surprising, from the perspective of stem-objectifications it was a matter of time.

5. 3 A scientific Zeno

The same delimited relational experiences that delude our sensory perception also misguide the rational principles and extrapolations of mathematics and science. The problematic of the latter will be investigated in this section and correlated with Zeno's paradox and so illustrate the implicit and ultimately fallacious assumption of locality as premise in modern scientific thought.

Modern day physics is characterised by an embarrassing disparity between two of the most successful scientific theories of the 20th century – the general theory of relativity and Quantum mechanics. Beyond the apparent contradiction of the one theory forbidding faster than light interconnections (Einstein's relativity) and the other essentially requiring such connections, the disparity revolves around the four postulated forces of nature (actually five if the more recent postulated antigravity force is considered). According to modern physic there are four fundamental interactions between particles: the weak, the strong, the electromagnetic, and the gravitational (Zee, 1986). Gravitational forces are what keep physical bodies from flying of the earth, holding planetary systems together, and controlling the apparent expansion of the universe. Electromagnetic forces (as the name indicates this force expresses a synthesis of electric force and magnetic force) holds atoms together, governs the propagation of light (in terms of electromagnetic wave description) and radio waves, causes chemical reactions and facilitates the cohesiveness of physical bodies. The strong force holds quarks together and consequentially protons and neutrons to form the nucleus. The weak force is another force found in the nucleus and refers to the process of beta-decay whereby an electron and its antimatter partner, a positron, are created when protons and neutrons are converted into each other to conserve the electric charge of the atom.

In contemporary science there is no single grand theory describing and explaining the four forces in a unified manner. On the one side there are the quantum field theories (broadly known as quantum mechanics) describing the weak force, the strong force and the electromagnetic force, while on the other side there is Einstein's general theory of relativity describing gravity. Apart from the fact that these two sides both

approximate to Newtonian physics on an everyday scale, they have very little in common. The two sides delineate to interpret on the one extreme very small objects and distances (quantum mechanics), and very large objects and distances on the other (general relativity). These delineations are characterized by very different mathematical structures, rendering them incompatible (Al-Khalili, 2003). Even within the domain of quantum field theories the distinctive theories have not yet been completely successfully combined. The electromagnetic force is described by quantum electrodynamics and the strong force by quantum chromodynamics (Penrose, 1989). An extended field theory, called the 'electroweak theory', was developed that unified the electromagnetic and weak forces. Despite electroweak theory and quantum chromodynamics both being quantum field theories, physicists have not been able to properly merge these two theories. A scheme for combining them has been developed, but it has not been verified experimentally. In the meantime particle physicists refer to a framework that loosely incorporates both the electroweak theory and quantum chromodynamics, called the *Standard Model*. In general physicists do not regard this model to be ultimately sufficient (Al-Khalili, 2003).

For the purposes of this section, the author will investigate the rationale of quantum field theory, which characterizes the domain of quantum mechanics. The central tenet of a quantum field theory is that something like an electric field can be thought of as many virtual particles popping in and out of existence all the time, as such acting as a type of particle exchange force between other particles (Capra, 1999). For example: the electroweak theory describes particles (like electrons) interacting by exchanging the force-carrying photons or W and Z bosons (virtual force carrying particles), quantum chromodynamics describes quarks exchanging gluons. The *supreme* quantum field theory is quantum electrodynamics, basically the theory of photons and electrons (Penrose, 1989). Quantum field theory is however plagued by mathematical difficulties in the sense that certain calculations lead to infinite answers. Quantum electrodynamics, the brain child of Richard Feynman, Julian Schwinger and Sin-Itiro Tomonaga, compensated for these infinities with a mathematical trick called 'renormalization'. What emerged was an extremely accurate theory from which all mechanical, electrical, and chemical laws and phenomena are ultimately derived. Some physicists, including the father of quantum field theory – Paul Dirac, didn't like

the way quantum electrodynamics' renormalization trick took care of the infinities. Mathematically speaking it seemed as though the awkward bits (the infinities), which arise when doing the calculations, were being swept under the carpet. Purists such as Dirac always felt this should not be necessary and held out for something more fundamental (Al-Khalili, 2003). This particular problematic of 'infinities in the calculations', will now be examined more closely and the provenance there-of related to the premise of locality.

The infinities that arise during the calculations of quantum field theory can be understood as follows (Al-Khalili, 2003): recall, as briefly alluded to earlier, that an electric field can be thought of as many virtual particles popping in and out of existence all the time. An electron interacting with another electron must be understood as a process where the force between the two particles is in actual fact the exchange of another particle, an electron for example. This interaction must take into account a series of evermore complex, but less likely, processes that can take place. For example: the *lowest order* process is that the two electrons exchange a single virtual photon. Higher order terms that must also be considered involve one of the electrons emitting a photon that spontaneously creates, whilst in transit, a virtual electron-positron pair (a matter particle and its correlating antimatter particle). These quickly annihilate to produce the original photon again that is absorbed by the second electron. During the short life of the electron-positron pair (the duration and energy amount of which is determined in accordance with Heisenberg's uncertainty principle – the energy/time uncertainty relation – discussed in section 2.2) there is a small probability that the electron-positron pair created by the exchanged photon can themselves exchange a virtual photon, which also creates a further electron-positron pair, and so on, ad infinitum. Quantum field theorists hoped that such ever-more complex activity could be ignored in the calculation, or at least become progressively less important, 'unfortunately' this was not the case and these higher order processes lead to infinite answers in the calculations. It is these infinity problems that quantum electrodynamics compensated for using the mathematical trick of *renormalization*. Renormalization did not solve the infinity problem, rather it found a way to work around the problem, or stated otherwise, to sweep the problem under the carpet.

However, the problem of infinities has a much more serious effect in a quantum theory of gravity. A consequence of Heisenberg's uncertainty principle is that waves (in the Maxwell field), even in the vacuum or lowest energy state, won't be exactly zero but can have small sizes. Thus each wavelength would have a ground state energy. Since there is no limit to how short the wavelengths of the Maxwell field can be, there are an infinite number of different wavelengths in any region of space-time and an infinite amount of ground state energy. Because energy density is, like matter, a source of gravity, this infinite energy density ought to mean there is enough gravitational attraction in the universe to curl space-time into a single point, which obviously contradicts our current experience of space-time (Hawking, 2001).

Now consider the indicative factors of the premise of locality enumerated in section 3.2, specifically factor 1 and factor 8. Wholly unassuming (or would wholly assuming locality be more appropriate?), the quantum field theorists are treading down the same path as Zeno. Moreover, similarly as Zeno assumes an exclusively and primary differentiated point A and point B, a fundamental here-there dichotomy, so the field theorists assume an exclusive and primary differentiated this-that particle (an electron vs. a photon or another electron, or, an electron vs. a positron). Whereas Zeno continuously, ad infinitum, traverses the half distances within the framework of his own conceptualized relation (the relation between point A and B), so field theorists continuously describe ad infinitum the interaction process of virtual particles within the framework of their own conceptualized relation of the two separate particles. Thus, similarly as Zeno's conceptualization of a relation within a relation prevents him from ever reaching the other point (traversing his first posited relation), so field theorists' positing of a particle here and particle there within or between another pair of here-there particles, prevent the calculations from providing a finite answer. Just as Zeno has to turn a blind eye to the logic that makes it impossible to reach the other point and just walk to the other point, so quantum field theorists have to sweep the infinities under the carpet and 'renormalize'. In both cases only the differentiation (opposition) of, alternatively, point A and B (Zeno), and this-that particle (Field theory) is acknowledged and not the co-occurring identicalness that a premise of non-locality requires. The problematic of counter-intuitive infinities, as illustrated by the latter two examples, are a consequence of the assumption of locality

and the consequent violation of the principle of symmetry (the concept of symmetry as a function of non-local perceptum will be the focus of section 6).

Consider a related problem that has been around long before quantum mechanics. An electric charge generates an electric field around it; the influence of the electric field on another charge can be calculated using Coulomb's law. The problem arises when physicists attempt to determine the effect this electric field has on the charge that generated it in the first place. To determine the effect of the field on the charge, physicists need to divide a certain quantity by the distance between the point they are interested in and the position of the charge. In this case that distance is zero, and dividing anything by zero gives an infinity answer. Recall the 'problem' of self-referential statements: Socrates' "I know that I don't know" can logically run around in circles ad infinitum. In the case of the effect of the electric charge, the question might be formulated as follows: what is the effect the electric charge has on its self? As such the physicists are essentially confronted by a self-referential question, a self-referential problem. And again, as is the case of Socrates' dictum, the logic of here-there/now-then, basically the premise of locality, breaks down. Logic related to the premise of non-locality would completely re-evaluate the specific elements (in terms of factor 1) involved and the questions asked about the relation of these elements (in terms of factor 8). The development of a possible mathematical formula that can describe the effects of an electric charge in the framework of non-locality as premise is beyond the scope of this thesis. The author provisionally notes that the principle of symmetry (as developed in section 6) will be essential to such a mathematical formulation.

Zee (1986) writes:

> In fundamental physics, after an era of unification and simplification, we seem to have entered an era of embellishments and complexities. Recent developments tend to be increasingly complicated; in particular superstrings theory involves an enormous jump in mathematical complication. (p. 273)

From the premise of non-locality this undesirable 'increase in complexity' is primarily a consequence of the implicit assumption of locality as premise that

pervades the rationality and logic of the natural sciences (and the human sciences for that matter). Even the contemporary scientific quest to discover the *smallest particle*, begins from the premise of locality, and will according to the logic of non-locality, walk the same path as Zeno.

In an attempt to unify quantum mechanics and the general theory of relativity, two dominant schools of thought have emerged. The one school claims that quantum mechanics contains the more fundamental concepts and that consequently quantum mechanics should serve as the base whence the general theory of relativity should be incorporated. A candidate theory in terms of the latter is for example - string theory. It is based on the principles of quantum field theory, and describes the force of gravity in terms of an exchange particle called the graviton. String theory differs from earlier quantum field theories in the sense that this theory holds that all the fundamental particles are in fact tiny vibrating strings. The different elementary particles are a consequence of the different frequencies at which these strings vibrate (Calder, 2003).

The other school disagrees and rather starts from general relativity with its fundamental notions of space and time, and tries to *quantize* this theory. The prominent theory in this regard is called 'Loop quantum gravity'. Here, the focus is on space itself, which is visualized as consisting of a network of loops – like lace, but in three dimensions. Each loop is formed by a particle with a certain spin making a little excursion and returning to its starting point. The loops do not exist in space – they are space. Twists in the loops denote the deformations of space due to gravity, while the passage of time is reflected in changes in the network. Space-time as a whole is the sum of all possible networks (Calder).

Provisionally, based on surface validity, neither of these two theories appear compatible with the postulated premise of non-locality. For example: in string theory, related to the action of the tiny vibrating strings, space and time are still regarded as an absolute background (Al-Khalili, 2003). From a premise of non-locality, space and time must be considered as illusory constructions of relational experience. Indeed, the positing or the requirement of absolute space and time, exemplifies the implicit assumption of a premise of locality (see factor 1). Regarding the theory of loop quantum gravity: the 'loops' are not real physical entities like the strings in string

theory, rather all that is real is the relationship between loops. From a premise of non-locality no relationship or network of relationships can be considered inclusively accurate or valid if the principle of symmetry is not applied – in the case of loop quantum gravity the loops themselves have to be considered to be identical yet opposite (see factor 8). All exclusively dichotomous relationships must be interpreted as forms of localized perception or rational conditioning akin to epiphenomena. The notion of dichotomous relation can be interpreted as an imposition of the horizontal spatial and temporal lines of the [R]-element on the circular intermediary phenomenon of absolute power states. Temporally speaking, absolute power states are a single moment, an omnipresent now, with a symmetrical differentiation of past and future. Spatially, absolute power states are something from nothing. In the framework of a non-locality premise, the principle of symmetry is fundamental to the conceptualization of absolute power states and will be expounded in section 6.

Absolute power states may, for explanatory purposes, be envisaged through the relational character of the [R]-element in terms of Planck's constant. In the year 1900 Max Planck developed a formula to describe the way a particular type of warm object, known as a black body, emits radiation. According to Planck's formula the energy of the smallest bundle of light of a given frequency is equal to the frequency multiplied by a certain constant. This is known as Plank's constant of action. It has the symbol *h* and, like the speed of light *c*, is considered by physicists to be one of the universal constants of nature (Hawking, 2001). According to the formula the energy given off could only have certain values (certain modes of vibration) since not all possible energies are allowed. Thus the energy would come in discreet lumps or 'quanta'. Planck's constant, which accordingly represents the quantized nature of energy emission and absorption, is an essential element in the understanding of subatomic phenomena. Einstein used Planck's constant to explain the photoelectric effect, and later he still used it to determine the specific heat of solids. Bohr discovered that the angular momentum of electrons as they orbit atomic nuclei is a function of Planck's constant, de Broglie used Plank's constant to calculate the wavelength of matter waves, and it is a central element in Heisenberg's uncertainty principle (Zukav, 1991).

Importantly, Einstein's use of Planck's constant to describe the photoelectric effect elaborated on Plank's idea that the absorption and emission of energy is a quantized

process, to posit that energy itself is quantized. This supposition allowed the calculations to correlate with the experimental data concerning the photoelectric effect (Zukav, 1991). Based on Planck's constant and Einstein's extension of the principle to include all energy forms, physicists now postulate that space and time itself must also ultimately be composed of irreducible lumps (Al-Khalili, 2003). The length and time scale where this quantization must take place is known as the Plank scale (Planck length – about 10^{-35} centimetres; Planck time – about 10^{-43} seconds, time it takes light to travel the distance of the Planck length).

In light of a non-locality premise, Planck's constant can be understood as follows: *h* represents a dichotomous spatio-temporal differentiation of absolute power states, which occurs in terms of the principle of symmetry (specifically the symmetrical [I] – see section 6). Stated otherwise: *h* represents a dichotomous relational differentiation of circular states that are not exclusively bound to spatio-temporal dichotomies.

Plank's constant expresses the connection of absolute power states in terms of the relational and associative character of the conditioned [R]-element. There is, however, no exclusive dichotomous spatio-temporal relation binding absolute power states. The experienced relation in terms of the space-time continuum is rather a symmetrical subsidiary. As such *h* rationally connects identical yet opposite space-time circular states and might consequently be understood as describing a single moment differentiating as multiple moments.

What is fascinating is that *h* can perpetually be deduced from experimental data from subsequent experiments, and can be utilized in other formulas (as indicated earlier) to accurately describe other different phenomena. The consistency of *h* (or any other successful theory or mathematical formula) is a consequence not of the veridical character of dichotomous relations, but of the symmetrical character of absolute power states. It is exactly the principle of symmetry, as related to absolute power states, that will be investigated in the next section and inform the conceptualization of *power to will*.

Section 6

6. Implication: From power to will

A premise of non-locality attributes fundamental significance to the notion symmetry, to be sure, non-local perceptum emanating as localized form bespeaks a symmetrical disposition. Recall 'the phenomenon of symmetrical states', the designated nomenclature of the cognitive ability to recognize contingency (mirror self-recognition), to produce contingency (imitation), and to partake in synchronic imitation. The capacity to recognize symmetrical phenomena informs the conceptualization of the desire of reciprocated subjectification and so injects dichotomous subject objectification with oxygen-rich blood. As such the phenomenon of symmetrical states, with its conscious anthropomorphic vitality, provides the transparent plinth on which the primary and secondary fields of objectification promulgate. The secondary field of objectification, the particular domain of interrelated leaf- and stem-objectifications, will now be implemented as methodological tool to illuminate the fundamental importance and pervasiveness of the principle of symmetry. Thus the instruments of pedagogy (stem and leaf-objectification) reflect on the very principle, the essential capacity that allows for their own psycho-functional conceptualization[5].

The child recognizing him/herself in the mirror can be regarded as experiencing a rudimentary leaf-objectification. The child is able to discern from his/her own movements and the mirror image's movements a certain invariance, a definite and unwavering correlation between his/her own activity and that of the image in the mirror. Recall the reciprocal and mutually constructing process of leaf- and stem-objectification expositioned in section 4.4. - exactly the same applies to the experience of symmetry. As Bentham's panopticon prison, a particular leaf-objectification, gave birth to the more extensive societal dynamics of disciplinary power, a specific stem-objectification, so the infant's particular symmetrical experience of the mirror can be regarded as a leaf-objectification, whence the

[5] Similarly as the eye is used to examine the physiology of the eye, so objectifications are used to examine objectification.

pervading principle of symmetry, a pervading stem-objectification, emerges. Important to note is that the latter set of stem- and leaf-objectifications represent the base cognitive symmetrical dynamic that outlines all other objectifications, including for example the panopticon prison and panopticon principle. This base cognitive symmetrical dynamic will be called the symmetrical [R] – the principle of symmetry in terms of the [R]-element. The symmetrical [R] can specifically be defined as follows: as certain features change between subjects, other features remain the same, or stated more plainly logical, certain features remain invariant while other features transform. As such the symmetrical [R] represents the pristine rationality of the phenomenon of symmetrical states, the animation pencil of dichotomous subject objectification. If the desire for reciprocated subjectification is primarily an emotional drive, then the symmetrical [R] is primarily a rational mechanism. In light of the amalgamated relationship of the [R]-element and the [E]-element, symmetrical [R] and the desire for reciprocated subjectification are functionally distinguishable, yet are in a very definite sense intricately intertwined. Dichotomous subject objectification can be regarded as the progeny of the amalgamated relation of the symmetrical [R] and the desire for reciprocated subjectification. From a premise of non-locality the principle of symmetry must primarily be considered in terms of the [I]-element. Before the author explicates the symmetrical [I], the pervasive applicability of the symmetrical [R] for localized perception will be expounded.

The symmetrical [R] acts as a window for localized perception, allowing the formation of dichotomous subject objectification and establishing a thematic framework that can be applied as an instrument for theoretical investigation. As an example of the symmetrical [R] consider the notion affect attunement (emotion attunement) discussed in section 4.2: Affect attunement was defined as the performance of behaviours that express the quality of feeling of a *shared affect state* without imitating the exact behavioural expression of the inner state. Thus the infant-mother interaction can perform various different behavioural actions, yet these *different* actions evince the *same* underlying emotional state. The mother and infant's respective bodily actions transform (not apparently correlated), while the [E]-element for both remains invariant. As such affect attunement is rendered intelligible through the [R]-element.

Furthermore, it is precisely Lacan's non-acknowledgement of the fundamental importance of the symmetrical [R] for the developing human cognition that leads to the incompatibility of his mirror stage formulation with contemporary empirical research in the domain of mirror self-recognition. Recollect the Lacanian differentiation of the subject (S) - the position of the own body, on toward the Other (O) - the outside world of reflected images in which the subject becomes alienated during the mirror stage; and furthermore the differentiation of the ego on toward the other (small o). Lacan posits this cumbersome dual duality as the basic and encompassing structure of the human psyche. As discussed in section 3.1, Lacan describes the relation between the S and the O as 'circular and *dissymmetrical*, yet without reciprocity' – this is a deductive formulation based on Lacan's interpretation that the infant experiences his/her own body as fragmentary and consequently identifies with the reflected whole images of the external world (for example his/her own image in the mirror). As such Lacan conceptualizes the infant's early postulated mirror-like experiences and real mirror experiences in terms of a fundamental *dissymmetry* assuming the form of a fragmentary body versus a whole outside image/body. Yet, as argued in section 4.2, it is originally the symmetrical characteristics of the mirror image that attracts the attention of the infant, not the dissymmetrical aspects. Consequently it is precisely the non-acknowledgement of the symmetrical [R] that imposes a sense of pessimism and nihilism on the Lacanian psyche. The premise of locality identified in Lacan's theory (see section 3.2), also exposes this theory to the typical infinity problems related to the locality assumption discussed earlier. The infinity problem the author is referring to concerns Lacan's conceptualization of the status or location of the subject. Recollect that for Lacan the subject is that which is represented by the signifier, and the signifier can only represent something for another signifier. Hence Lacan infers that the signifier represents the subject for another signifier and that the subject ought to be sought in the very structure of the signification chain (sentences, paragraphs, in speech), or indeed, that the subject is this very chain. Consequently the subject, as a result of alienation function of the Other, runs along the signification chain *ad infinitum* in search of itself.

Also note the resemblance between, on the one hand, Lacan's exposition of the L-schema (section 3.1) in terms of how the relation between o – o' (the imaginary

relation) forms an obstacle to the subject's symbolic realization, and Zeno's paradox on the other. Whereas for Zeno point B remains ever elusive, so for the Lacanian psyche the realization of the subject and the truth of the subject remains unreachable.

The significance of the symmetrical [R] extends far beyond the traditionally demarcated domain of psychology, underlying 'even' (a more accurate word would be 'necessarily') the most empirical of sciences – the natural sciences. The principle of symmetry has shone brightly as a guiding light for exploring physicists. In this regard Zee (1986) states:

> Fundamental physicists are sustained by the faith that the ultimate design (of nature) is suffused with symmetries. Contemporary physics would not have been possible without symmetries to guide us. Einstein showed us how the secrets of gravity could be mastered in one fell swoop. Learning from Einstein, physicists impose symmetries and see that a unified conception of the physical world may be possible. (p. 280)

In fact, Einstein himself wished that he had rather used the term *invariant* theory instead of special and general theory of *relativity* (Zee, 1986). The whole point of Einstein's work is that different observers must perceive the same structure of reality and that an invariant truth can be extracted. Strictly speaking, relativity theory is not a theory by itself, but a requirement that has to be satisfied by physical theories, this requirement being the symmetrical [R]. The principle of symmetry can assume various forms, for example: rotational invariance, Lorentz invariance, relativistic invariance, general covariance, and reflection/parity invariance.

Rotational symmetry of geometric figures implies the following: a geometrical figure is rotated around its centre and these rotations leave the figure unchanged. For example: a circle is left invariant by rotations around its centre through any angle, while the square is left unchanged only by rotations through angles of 90º, 180º, 270º, and 360º. Thus the circle is said to be more symmetric than the square. The rectangle is even less symmetric than the square, because it is left invariant only by rotations around its centre through angles of 180º and 360º. Relativistic invariance (the primary assumption of Einstein's relativity theories) says that two observers in

relative motion at a constant velocity must arrive at the same physical laws, in spite of the fact that they differ in the measurement of various physical quantities, furthermore relativistic invariance dictates that it is physically impossible to determine which one of the two observers in relative motion is actually moving (Zee, 1986). If the physical laws observed by the two specified observers were not the same, then nature would be distinguishing between the two observers. As such relativistic invariance would be violated and the basic symmetry broken.

Einstein used this principle of symmetry in the form of relativistic invariance to demonstrate that different observers in relative motion at constant velocity perceive the passage of time differently, thus rendering the notion of absolute time, an absolute frame of reference, redundant (consequently throwing Galilean transformation out the window). Einstein's insistence on relativistic invariance is dependent on another transformation under which physics is relativistic invariant. This transformation is known as Lorentz invariance and requires that the relations between two sets of space-time co-ordinates are such that the speed of light comes out to be the same as measured by the observers in relative motion at a constant velocity (Zukav, 1991). Thus the invariant variable is the speed of light and not time. Einstein believed that Lorentz invariance is a necessary criterion for all of physics. Recall Schrödinger's wave equation as discussed in section 2.2, which is used to calculate the wave function and so indicate the possible behaviour and consequent probability of finding a subatomic particle at specific location. Originally Schrodinger's wave equation was not Lorentz invariant, but since particles like electrons move much slower then the speed of light the equation was perfectly adequate in describing the known properties of atoms. In 1929 Paul Dirac, like Einstein before him, insisted that all physics be relativistic invariant, and thus proceeded to make Schrodinger's wave equation Lorentz invariant. The modified equation possessed twice as many solutions as the original. After much bewilderment and confusion, Dirac realized that the additional solutions indicated the existence of particles that possessed properties exactly the opposite of normal matter particles. So for every electron there must exist an opposite particle, an anti-electron. Three years later the existence of the electron's anti-particle was experimentally verified and is known today as the positron (Zee, 1986). Thus symmetrical [R] allowed certain aspects of nature to be accurately described a priori.

Furthermore the principle of symmetry was also successfully utilized by Einstein to describe gravity in the form of the equivalence principle – the equivalence principle simply states that the physical effects of a gravitational field, as perceived by an observer, are indistinguishable from the physical effects reported by another observer accelerating at a constant rate in the absence of a gravitational field (Zee, 1986). Also, the mathematician Emmy Noether demonstrated that symmetry and conserved quantities are interrelated. This was a profound discovery indicating that the conservation laws (for example the conservation laws of energy, momentum and angular momentum) always have a corresponding symmetry, for example: Noether's theorem reveals that angular momentum conservation follows from rotational invariance. Noether's theorem has proven to be of fundamental importance for quantum mechanics (Zee, 1986).

The form of symmetrical [R] most pertinent to a premise of non-locality is the notion of reflection invariance (also called parity invariance). Reflection invariance is concerned with whether nature distinguishes between left and right (Zee, 1986). This principle dictates that if one were to observe any physical process in the mirror (like a bat hitting a ball or an atom emitting a photon), this process must not contradict the laws of nature as physicists know them – the laws of nature must remain invariant. If nature is reflection invariant this means that nature does not distinguish between left and right (that chirality is not intrinsically significant), and consequently parity is not violated.

Up until 1956, physicists held it as self-evident that nature is parity invariant, since then various experiments have however indicated that nature appears in the case of the weak force (and only in the case of the weak force) to violate parity invariance. One of the physicists responsible for constructing the experiments that intimate parity violation, C. N. Yang, suggests that a deeper understanding will reveal that nature indeed does respect reflection/parity invariance. In fact, several theorists have since the 1980s proposed plausible schemes which demonstrate that nature, at a deeper level, is impartial towards left and right (thus reflection/parity invariant) (Zee, 1986). Please refer to appendix B where the author indicates a possible logical error made by physicists concerning parity invariance.

From a premise of non-locality the symmetrical [R] must be regarded as an epiphenomenon related to the character of absolute power states. Recall that in section 5.1 the author described absolute power states as 'discontinuous manifesting spatio-temporal *circular states*, which biological cognition experiences/interprets as repetitive patterns of locality movement'. The specific description of absolute power states as *circular states* is based on the symmetrical [R] in the form of reflection invariance explicated earlier. A circle exhibits perfect reflection invariance across any straight line that passes through its centre. Thus absolute power states are always identical, yet always opposite – perfectly reflection invariant. However, in light of the premise of non-locality, the logic of the [I]-element must now also be applied to the principle of symmetry. This entails the following: the principle of symmetry is accordingly formulated, not exclusively in the manner of certain aspects remain the same while other aspects change, but also in the sense that the aspects that remain the same, also change, and the aspects that change, also remain the same. The preceding formulation represents the gist of 'the symmetrical [I]'. Thus in the case of absolute power states the symmetrical [I] implies that absolute power states are 'identical', 'opposite' and also 'identical and opposite'. Such an understanding of absolute power states in context of the premise of non-locality represents the nucleus of *the power to will*. Consider the following analogy: as the little bird experiences her image in the mirror and does not recognize the image as her own, so man experiences the other through absolute power states and does not recognize these multifarious forms as his own being. Whereas the little bird fails to recognize the symmetrical [R] of the mirror image, so man fails to recognize the symmetrical [I] of absolute power states. Therefore it can deductively be stated that men and women fail to recognize themselves in their brothers and sisters.

Accordingly the delimitations of the premise of locality can also be understood in the form of the symmetrical [R]. The premise of locality, exemplified by the conditioned [R]-element, can never wander beyond the borders of irreconcilable '*differentness*', or '*opposition*', because the exclusively dichotomous localized perception itself is this border, and perpetually creates and believes its own creation and conditioning. In the realm of the conditioned [R]-element, what is different cannot be the same, and what is the same cannot be different. Theoretical mountaineers setting up base camp at the premise of locality inexorably become lost on the mountains of infinity. Be these

infinities paradoxical self-referential statements, quantum field theory interactions, mathematical Real numbers, Zeno's never ending quest, or Lacan's unattainable desire. Consider in this regard Socrates' dictum – 'I know that I don't know'. The paradoxical nature of the latter dictum is precisely a consequence of logical interpretation through the prism of the symmetrical [R]. The same yet opposite act is performed, and when what is opposite moves towards its opposite, logic breaks down – this is necessarily so because from a premise of locality what is opposite cannot also be the same.

The delusional and delimiting pith of the premise of locality in the form of a prototypical '*differentness*' or '*opposition*', is clearly expressed in the Adlerian *will to power* as discussed in section 5.1. As indicated, for Adler the basis of human motivation is subsumed by the striving for superiority (power). One can interpret (among other interpretations) such a formulation to bespeak a subject's desire to strive for superiority over another subject, where the first subject thus '*opposes*' another subject, and confronts, challenges and attempts to overcome the '*different*' other subject (even if it is in accordance with the higher motivation of 'social interest' – the second dynamic of the striving for superiority referenced in section 5.1). Adler also defines the striving for superiority as a striving to move from the bottom to the top or to change a minus into a plus, and that is why he sometimes calls it the striving for perfection (Adler, 1930). Thus one finds the implicit idea of a less perfect subject attempting to become a more perfect subject, a weak subject striving to become a strong subject, a lower subject desiring to become a higher subject. Therefore this Adlerian notion readily translates into the humanistic notion of 'becoming what you are', in the sense that – a subject with specific qualities at a certain point in time, *becomes*, as time progresses, a subject with different qualities at a future point in time. As such intimating a subject experience originally having the status of unrealised potential, developing or advancing to a subject experience evincing realized potential – accordingly, in Adlerian terms, the strong subject position being the potential of the weak subject position, the more perfect subject being the potential of the less perfect subject. Consequently it should be clear that both the Adlerian perspective and the 'becoming what you are' dictum, fundamentally assume the premise of locality in the form of exclusive spatio-temporal subject positions – be it the self on toward the other, or the now self on toward the then (future) self (factor 1, 6 and possibly factor

2, 3), and, concerning the specific point in case, subversion of the principle of symmetry in terms of the [I]-element through the exclusive emphasis on 'differentness' and 'opposition' of subject positions (factor 8).

The desire of becoming, of striving for superiority, *the will to power*, necessarily suffers from the undesirable infinity fate characteristic of the premise of locality, in the sense that – psychologically the subject can become and become ad infinitum, while physically the subject becomes what he or she is right into the grave. The premise of non-locality, while emphasizing the desire for reciprocated subjectification, disavows the primacy of this desire and rather professes the illusory character there-of. The symmetrical [I] requires that all dichotomous subject objectifications can be considered as different, but also as exactly the same. So whereas the premise of locality forces, for example, the conceptualization of desire in Lacanian psychology to be insatiable and unattainable (related to a fundamental lack of being discussed earlier – section 3.1), the premise of non-locality, through the acknowledgement of the [I]-element, posits the desire for reciprocated subjectification to be a mirage that ultimately dissolves in the light of *the power to will*. That is, if a person believes the dichotomous subject objectifications to be veridical and exclusive, and as such considers only the self on toward the other and not also the 'self and the other', then the desire for reciprocated subjectification is reified, adhered to, and perpetually produced ad infinitum from one moment to the next. From a premise of non-locality the desire of reciprocated subjectification is transcended in those moments where non-local perceptum, through the eyes of localized form, experiences the nature of absolute power states - experiences not only differentiated or opposed subject positions, but also the other as the self and the self as the other. Thus, whereas *the will to power* dissymmetrically exclaims – 'becoming what you are!', *the power to will* symmetrically whispers – 'being here and now'.

Regard also the Nietzschean 'will to power' as conceptualized by Foucault in terms of the Nietzsche's hypothesis (see section 5.1). Appropriately the philosopher Friedrich Nietzsche wrote a book entitled 'Becoming what you are'. Recall that this hypothesis puts forward the idea that power should be analysed primarily in terms of struggle, conflict and war, and consequently argues that the basis of the relationship of power lies in the hostile engagement of forces. The notion of war/conflict aptly represents

pervasive effects related to the desire for reciprocated subjectification, and as such describes the common everyday experience of struggle and difficulty as perceived through the typical cognition of dichotomous subjectification. Consider the following analogy: an active pathological virus always experiences the human body as a hostile and restless environment due to continuous attacking waves of white blood cells defending the body. Viruses would readily characterize their experience of the human body in terms of struggle, conflict and war. In the world of viruses the human body would be a necessary yet often unfriendly habitat. Similarly the everyday human experience of a self in a world of localized phenomena, often exhibits conflict, struggle and war. The 'I' and the 'you' epitomize the illusion of dichotomous subject objectification and activate patterns of manifesting absolute power states. In the world of the self the localized experience is a necessary yet often unfriendly habitat. The premise of locality, the self, and *the power to will* - are comrades of war, brothers in arms.

To deepen the understanding and illustrate the importance of *power to will*, contemplate the spread of dichotomous subject objectifications (see section 5.2) where a basic leaf-objectification that characterized the experience of a prisoner held captive in a panopticon type structure, permeated social thought as a stem-objectification in the form of the panopticon principle which is fundamentally related to the possibility and occurrence of disciplinary mechanisms of power. Disciplinary power, representing a particular social paradigm functionalised through current degenerating or developing social, political and economical structures, continues to exist and proliferate only insofar as it is allowed and discontinuously produced by the conglomerating networks of dichotomous subject objectifications of singular localized cognitions. The perceptive fields of singular individuals amalgamate through discursive practices and non-discursive practices (example: classroom designs, transportation methods, technological appliances) confronting, denying and proliferating certain lines of objectifications that are as much a part of the individual's idiosyncratic field of objectifications, as they are a part of the conceptualized and recognized prevailing societal paradigms. In accordance with the conditioned and experienced 'allowance' of the desire for reciprocated subjectification, the multifarious conscious or unconscious lines of objectifications carry varying emotional significance. The emotionally laden lines of objectifications, developing in

terms of the reciprocity of leaf- and stem-objectifications, constitute the person's political beliefs, religious beliefs, self beliefs, etc – they animate the person's personal and social perspective and experience of the world.

Accordingly, if one thus acknowledges the direct link between the individual's perceptive field and societal paradigms, a certain *cognitive dissonance* or fundamental hypocrisy is to be expected in the dichotomous subject objectification field of the localized cognition (the individual perceptive field) – necessarily so if any validity is to be attributed to the Foucaultian conceptualization of permeating power relations. To substantiate the latter claim, consider the following polemic.

Recall, as discussed in section 5.1, Foucault's description of the superimpositioning of sovereign power (the contract-oppression schema) on disciplinary power (the domination-repression schema) as to obscure the actual elements of domination inherent in the latter. To this end Foucault describes how the juridical systems have enabled sovereignty to be democratised through the constitution of a public right articulated upon collective sovereignty, and that this democratisation of sovereignty was fundamentally determined by and grounded in mechanisms of disciplinary coercion. Recall also, as discussed in section 5.2, that disciplinary power, characterized by tiny, everyday, physical mechanisms, which are essentially non-egalitarian and asymmetrical, supported the general juridical form that guaranteed a system of rights that were egalitarian in principle. According to Foucault (1975/1977) the real, corporal disciplines constituted the foundation of formal juridical liberties. Thus a contradictory and heterogeneous interplay of power emerges where the will of all form the fundamental authority of sovereignty (a sense of democratic equality), but the disciplines provide at the base a sense of inequality.

The link between an individual's perceptive world and contemporary societal paradigms imply that the notion of 'democratised sovereignty' necessarily forms part of the labouring and law-abiding citizen's network of dichotomous subject objectifications. Foucault (1976/1980) states that sovereign power and disciplinary power (the constitutive elements of democratised sovereignty) are so heterogeneous that they cannot possibly be reduced to each other. On the one hand there is the juridical-political theory of sovereignty, articulating principles of equality

implemented through and symbolized by law and judicial rules. On the other hand, absolutely antithetical to and incompatible with the these transformed relations of sovereignty, the polymorphous mechanisms of disciplinary power that produce discourse that speaks of a rule - precisely not the rule of right (juridical rule) deriving from sovereignty, but rather a 'natural' rule, a norm. The disciplines define, not a code of law, but a code of *normalization*. Thus subjects become normalized, that is, they are "compared, differentiated, hierarchized, homogenized, excluded" (Foucault, 1975/1977, p. 183). The disparity of these two forms of power represent the basic dynamics regarding the general mechanisms of power that characterize modern society, Foucault (1976/1980) writes:

> I mean, more precisely, that disciplinary normalizations come into ever greater conflict with the juridical systems of sovereignty: their incompatibility with each other is ever more acutely felt and apparent; some kind of arbitrating discourse is made ever more necessary, a type of power and of knowledge that the sanctity of science would render neutral. (p. 107)

The exact same disparity can consequently also manifest in the form of minute capillary lines of contradictory dichotomous subject objectifications that constitute a person's secondary field of objectification. The latter statement can be explicated in the following way: a democratic government, like for example our own fledgling South-African democracy, professes an equality of human rights, a universal right enforced through a legal edifice built on egalitarian principles, yet, antithetically, this same economic-political state evinces (never mind the question of black empowerment) a labour force that is differentiated, segmented, hierarchized, specialized, documented, graded, evaluated, promoted, retrenched; an education system that homogenizes, excludes, classifies, examines, tests, rewards, expels. According to Foucault the latter all typify disciplinary peripheral procedures aimed to create docile and subjugated bodies, thus revealing minute capillary lines of asymmetry and inequality that confront and inform the personal rational experience of an individual[6]. Basically people might be educated as to believe that all people are equal and that this is what a decent, civil and democratised person should aspire to,

[6]In 'Discipline and Punish', the section called 'Docile bodies'- Foucault discusses various practical examples regarding the normalization procedures of disciplinary power.

yet the everyday lives of these self same people are permeated by the very real experiences of inequality - a social and industrial system that does not equally appreciate and compensate all, occupations that reward selectively, fiscal institutions that marginalize, judge and discriminate. Thus in the mind of the democratic individual of modern society, in the personal field of dichotomous subject objectifications of the democratised law-abiding and labouring individual, a definite *cognitive dissonance* or hypocrisy is to be expected proportionate to the emotional significance of the various conditioned lines of rationality converging and diverging to construct a belief system.

The latter has important clinical implications: a person who accepts the principles of democracy (a sense of explicit equality), yet also, without any pertinent reservations, participates in the socio-economical system (a sense of implicit inequality), might, in consideration of the person's idiosyncratic configuration of objectifications (the person might have an objectification that says that 'hypocrisy' is a part of life, it is 'normal') and the distinctive emotional value attributed to these conflictual lines of thought, experience a psychological state ranging on a scale from feeling slightly uneasy/confused, to a full blown psychotic episode (as various contradictory or traumatic lines of objectifications converge).

The preceding problematic can be traced back to the basic anatomy of dichotomous subject objectifications, the rudimentary conditioning of localized perception. Recall that dichotomous subject objectification is a dyadic phenomenon that implies the synchronic emergence of self-awareness and other-awareness. Thus, through the conditioning of the [R]-element in terms of the phenomenon of symmetrical states, the individual becomes aware of the self as subject on toward the other as a different and distinct subject. A premise of locality, in light of the symmetrical [R], dictates that the self and the other are differentiated and opposed bodies, and that what is different cannot be the same and vice versa. Different subjects might have features that are different and features that are the same, but the features that are the same cannot be different, and the features that are different cannot be the same. The self on toward the other is central to the premise of locality, and it is this basic impassable subject-object dichotomy that draws the line of difference which cannot be traversed by that which is the same. Considerations regarding equality/inequality (as discussed

in terms of the *cognitive dissonance* exposition) always condense into the disparate difference of opposing subjects. The cul-de-sac of dichotomous subject objectification infinitely questions the equality/inequality rubicon through the logic of the symmetrical [R]. The premise of non-locality bespeaks a wholly different logic; *the power to will* bespeaks the symmetrical [I].

The implication of the symmetrical [I] is the following: people can be 'equal', people can be 'unequal', and people can be 'equal and unequal'. Alternatively: Socrates can 'know', Socrates 'cannot know', and Socrates 'can know and not know' at the same time. Consequently, as was the case with the 'dead and alive cat', being equal and unequal (or knowing and not knowing) at the same time is completely foreign to the normalized conditioning of the [R]-element – basically, localized cognition has a very hard time making sense of the notion of 'either-or' and 'and'. Thus, assuming a premise of non-locality, one is lead to admit, as Socrates so boldly confessed, that one is indeed ignorant, that 'I know that I don't know'. Such a declaration does not admit failure or futility, but rather admits the courage to challenge the desire for reciprocated subjectification, to confront one's most precious beliefs, one's most enamoured dichotomous subject objectifications. Indeed, the life not criticized is not worth living.

Consider also the symmetrical [I] in relation to the domain of religion. Beyond illustrating the point, religious beliefs often form an important part of a person's field of dichotomous subject objectifications – therefore it would be necessary to excavate any hidden assumptions of locality present in a person's religious perspective. In the case of Christianity, the symmetrical [I] dictates a reinterpretation of the notions of Christ vs. the anti-Christ. The premise of locality describes a fundamental and exclusive opposition, in the sense that Christ is good and the anti-Christ is bad, and that it is imperative for a christian to accept Jesus as his/her saviour (the Christ), renounce the devil (anti-Christ), and so gain passage to a blissful afterlife, thus avoiding eternal damnation. A premise of non-locality paints a completely different picture. Regarding the symmetrical [I], *the power to will* consequently not only acknowledges the difference/opposition of the Christ and of the anti-Christ, but also the sameness. And this acknowledgement is not the symmetrical [R] kind of acknowledgement where these two elements have certain features that are the same

and also have certain features that are different, no, rather what is the same must also be different, and what is different, must also be the same. The symmetrical [I] prescribes a religious perspective where the Christian must consider 'the Christ', 'the anti-Christ', and 'the Christ and the anti-Christ'. Thus, if Jesus is sitting on the right hand of God, then Lucifer is sitting on the left hand of God – 'either-or' and 'and'.

Power to will, being here and now, attributes an epiphenomenal character to all patterns of localized 'movement', to semantically reiterate: bodily forms assume an epiphenomenal dynamic in relation towards every other bodily form – implying not only a 'link between bodies' or exclusive dichotomous 'inter-relations', but also the 'link of bodies' or 'intra-relation'. Stable patterns like for example - Planck's constant, objects that consistently fall towards the earth and not away from the earth, and repetitive symptom patterns related to psychological afflictions which allow for the compilation of diagnostic manuals (like for example the DSM-IV) - can be considered inferential stabilities, surface phenomena manifesting in accordance with the symmetrical dynamics of absolute power states.

Mankind's capacity to recognize symmetrical patterns, to recognize him/herself in the mirror, is the same capacity that will ultimately allow man to recognize the self in the other and the other in the self. The cognitive capacity that animates the desire of man, will also serve to transcend the illusion of desire. This is the process of *power to will*.

7. Conclusion

The study has meticulously mapped the topography of the premise of non-locality, starting from the simple two-slit experiment and tracing a line all the way through to the concept of *power to will*. On route the premise of locality was diagnosed and indexed as to its indicative factors. Subsequently an autopsy of Lacan's decentred ego revealed his developmental mirror DNA to be suffused with malignant locality assumption mutations. Whence the provenance of the genetically deformed Other that is incapable of recognizing itself in the mirror of contemporary mirror self-recognition research.

The premise of non-locality intuited the conceptualization of non-local perceptum. The emanation of non-local perceptum as localized form was translated into spatio-temporal perceptive experience in the shape of root-, stem- and leaf-objectifications. The study demonstrated how the latter differentiations of dichotomous subject objectification are rationally and emotionally animated by the phenomenon of symmetrical states in the form of the desire for reciprocated subjectification. The desire for reciprocated subjectification expressing the convolution of biological and psychological needs characterized by the cognitive capability to discern symmetrical interactions. Features of root-, stem-, and leaf-objectifications were further elucidated by enunciating the intra-relation there-of with the concept of absolute power states – absolute power states representing a logical formalization of the localized dynamics of non-local perceptum. As such the study conjoined, on the one hand, the explicated symmetrical qualities of absolute power states with, on the other, the correlation of dichotomous subject objectifications and Foucault's understanding of power, to synthetically articulate a pattern (a symmetrical epiphenomenon) of localized experience through the gaze of objectification, as such elucidating the diffuse and evolutive character of objectifications.

Furthermore, non-local perceptum was encoded as to a Socratic psychological model based on Socrates' infamous dictum – 'I know that I don't know'. The constructed Socratic model identified three fundamental elements – the [R]-element, the [E]-element, and the [I]-element. The author substantiated the abstraction of the [R]-

element and the [E]-element by examining contemporary research related to brain physiology.

Regarding the [I]-element: expounding the logic of the [I]-element and the logic for the conceptualization there-of, the study explicated the necessity of this third element by identifying various incongruencies facing a premise of locality in the shape of logically problematic paradoxes and contradictions. By acknowledging the premise of non-locality and consequently applying the [I]-element to the latter paradoxes and contradictions, new light was shed on the possible meaning of Socrates' self-professed ignorance.

The significance of the logic entailed by the [I]-element, and the postulated symmetrical nature of absolute power states, were conjunctively summarised in the formulation of *power to will*. Elucidating the meaning of *the power to will*, the study showed how radical transformations concerning 'what is sensical', is required if the validity of a premise of non-locality is acknowledged.

Possible implications and novel avenues for further research preliminary evinced by the study are the following:

I. Replacing the premise of locality with the premise of non-locality can revolutionalize the ethos of modern day psychology. A premise of non-locality dictates and informs a re-evaluation of the most enamoured psychological theories and therapeutic practices developed over the last century. For example: as already demonstrated with the post-modernistic theory of Lacan (which by its own post-modernistic tendencies already entails a kind of critique of typical modernistic theories), the non-locality assumption activates a fresh matrix for analysing psychological theories, and by its own eccentric logic reconfigures the conceptualization of the anatomy and physiology of the ego or subject.
II. The [I]-element provides a pristine perspective to re-evaluate 'traditional' and contemporary logic problems infesting the domain of science and philosophy, for example: the infinity problems of quantum field theory, the disparity

between Einstein's relativity theory and quantum mechanics, and philosophical paradoxes like self-referential statements.

III. A premise of non-locality implies that the 'movement' of physical bodies, thus all localized forms, are patterns of conditioning and as such do not represent some fundamental irreducible ground state. Consequently, that which is rational is also a form of conditioning (see section 4.1), thus entailing that all dichotomous subject objectifications, the experience of the self or the 'I', are derivatory epiphenomena. The study argued that all physicality and also all experiences of the self as rational and emotional subject are animated by symmetrical dynamics.

IV. The notion of stem-symmetry provides a possible therapeutic technology. The rational principle of symmetry (related to the symmetrical [R]-element) where something stays the same while something else changes, characterizes, according to a premise of non-locality, the perceptive world of the individual. In a therapeutic context during the initial phases of treatment, a therapist might attempt to identify the pathological dichotomous subject objectifications that configure around the desire for reciprocated subjectification. Thus the desire for reciprocated subjectification remains invariant, while the particular objectification that dehisce around this desire are variable (change). So the principle of symmetry provides a searchlight to seek out the psychological pathology. Future study might reveal a certain sense of symmetry that characterizes the rational and emotional interaction of two or more people.

V. The study demonstrated that Lacan's mirror stage formulation is logically incoherent (in terms of conventional either-or logic, *and* in terms of the [I]-element's logic), and ultimately conceptually incompatible with contemporary research findings in the field of mirror self-recognition. The validity of Lacan's subsequent conceptualization of the alienating Other, the L-schema (the quadrate structure of the subject), the name-of-the-father, the pessimistic and nihilistic impasse of desire, and his exposition of the function and role of language as it relates to the speaking subject, is accordingly dubious.

VI. The author postulates, in light of the discussion on the process of affect attunement (section 4.2), that the emotional brain circuitry of the autistic infant involved (or the 'normal' neural pathways that should be active) in the infant-caretaker interaction at around 9 months is possibly deficient, or highly

underdeveloped. The *basic matrix of emotional resonance* (the shared platform of attunement and empathy) can be implicated as the defective cognitive capacity in autism. If research vindicates the latter postulate, psychological and physical therapeutic measures can be developed and administered specifically to the perceptive domain of root-objectification.

VII. Comparatively, by better understanding the deficient nature of autistic children's root-objectifications, a better understanding of the dynamics of the root-objectifications of normal individuals will be facilitated. Such an understanding would be especially beneficial for developing interventions for psychotic afflictions, since adverse experiences related to the domain of root-objectifications is expected by the author, due to the predominance of emotional brain circuitry in the absence of the capability for objectification during the first two years of life, to be fundamentally involved in the aetiology of psychosis.

VIII. Future research can attempt to conceptualize the inter-relation of sexuality and the desire for reciprocated subjectification. Provisionally the author posits that the disposition of hetero-sexuality or homo-sexuality might be associated with the primary field of objectification, specifically the inter-relation of root-objectifications on the one hand, and stem- and leaf-objectifications on the other. Future research can also examine the psychosexual stages of development in terms of the desire for reciprocated subjectification to establish possible stable (universal) patterns of dichotomous subject objectification formation.

IX. The symmetrical [I] reformulates the question of morality. What is ethical concerns not only the self in relation to the other, but rather the self, the other, and the 'self and other'. Concomitantly *the power to will* has methodological applicability to the domain of religion. Religious beliefs constitute a significant part of many people's network of objectifications, therefore various religious doctrines must be analysed through the methodological logic of non-locality to expose the possible psychological effects and implications of the religiosity in question. In many cases what people believe to be their salvation, surreptitiously acts as their self-condemnation and delimitation.

X. The substitution of *the power to will* for the *will to power*, entails a socio-political telos not directed towards the domination of one group of people over

> another, or the striving of one political party for superiority over another political party, or a religious doctrine attempting to impose its belief system on people, or one race of people trying to ignore their differences in relation to another racial group and focus on their mutual similarities, but rather directing the individual person to contemplate his/her rational beliefs and emotional feelings in terms of the [I]-element, a social-political telos where the governing or political or social person acknowledges the epiphenomenal character of his/her personal beliefs and explores the meaning of the 'self', the Other, and 'the self and other'. The *power to will* prescribes a political system that respects the differences and similarities of various ethnic groups, and also respects that these differences are similar and the similarities are different.

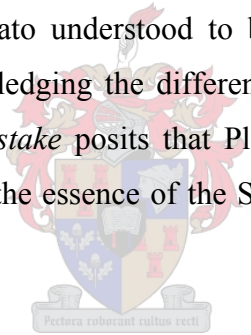
To conclude the current study of the premise of non-locality, the meaning of the *brilliant Greek mistake* will be elucidated. Consider the following paragraph formulated by the author:

> 'Emphasizes that all understanding is subjective opinion, truth seen as relative and not absolute, a deeper stable reality (objective essences) is neither accessible nor positable, a flexible atheism in metaphysics, relative moral values, appreciation of the plasticity and constant change of knowledge, a focus on the concrete and pragmatical, the application of a critical rationalism.'

The reader might be excused for thinking that the preceding paragraph is a description of general post-modernistic tenets. In fact, this paragraph is a characterization of the Sophistic movement of 5th century ancient Greece (B.C.). Both these paradigms (Sophism and Post-modernism) reveal a definite sense of scepticism and relativism, and both can be considered as a reaction to or a gradual development of a preceding more absolutistic paradigm. In the case of the Sophists the preceding paradigm was the ancient mythological paradigm primarily characterized by the Homeric Iliad and Odyssey, thus evincing a paradigmatic shift away from belief in the truth of the Homeric Gods and their divine rule, towards a modern secular and relativistic rationalism (Tarnas, 1991). In the case of the post-modernists the preceding paradigm was modernism, thus evincing a paradigmatic transition from a belief in science and

the laws of nature, to a pluralism typified by an unending relativism and existential finitude (Tarnas, 1991).

It was at the height of the tension between the ancient Olympian tradition and the sceptical new intellectualism of the Sophists that Socrates entered the philosophical arena. Socrates himself wrote nothing, and it is predominantly through the Dialogues of Plato that one can discern a silhouette of the philosophy espoused by Socrates. Yet, exactly where Socrates' philosophy ends and Plato's begins, is a hotly disputed issue amongst modern day scholars (see section 4.5). It is precisely at this elusive conjunction that the author positions *the brilliant Greek mistake*. Recall the distinction made by Vlastos (1991) between the Socrates of the earlier dialogues and the Socrates of the later dialogues. It appears that the early dialogues are a kind of biography of the idiosyncratic spirit of Socrates' dialectic investigation, while Plato's later dialogues represent a gradual elaboration and transformation of his master's ideas to bring them to what Plato understood to be their inherent metaphysically articulate conclusions. Acknowledging the differentiation of E – Socrates and L – Socrates, *the brilliant Greek mistake* posits that Plato's understanding of Socrates' philosophy was inaccurate, that the essence of the Socratic ignorance was lost in the matured Platonic doctrine.



In light of the premise of non-locality, the Socratic experiential psychological model does not consist of the desiring-element, rational-element, and the emotional-element, but rather of the intuitive-element, the rational-element, and the emotional-element (see section 4.5 for discussion). Consider the discussion L – Socrates has with Cebes in *Phaedo*[7] regarding the nature of opposites, L – Socrates (Plato, trans. 2003a) states:

> It seems to me not only that tallness itself absolutely declines to be short as well as tall, but also that the tallness 'in' us never admits smallness and declines to be surpassed. It does one of two things: either it gives way and withdraws as its opposite shortness approaches, or it has already ceased to exist by the time that the other arrives… nor will any other quality, while still

[7] *Phaedo* is considered to be one of Plato's later dialogues, hence Late-Socrates. See Vlastos (1991).

> remaining what it was, at the same time become or be the opposite quality; in such a situation it either withdraws or ceases to exist. (p. 179)

Plato's argument beautiful typifies the premise of locality by describing the exclusive spatio-temporal dichotomy inherent to the conditioned [R]-element (the symmetrical [R]) – what is opposite cannot be the same, and what is the same cannot be opposite. Yet, as the study has demonstrated, this is exactly what the [I]-element prescribes! Thus *the brilliant Greek mistake* is basically a product of Plato's non-acknowledgement of the [I]-element, his non-exploration of the premise of non-locality.

In the form of *the brilliant Greek mistake*, the philosophy of Plato, with his emphasis on the [R]-element and his conceptualization of a grandiose metaphysical theory of 'separately existing' forms (see section 4.5), substituted the reigning scepticism and relativism of the Sophists with a rationally animated metaphysical flavour of absolutism. Hellenic thought, most fully embodied in the philosophy of Plato, has been extremely influential in the historical development of Western civilisation and still pervades the modern mind (Tarnas, 1991). Consequently modern man has also inherited *the brilliant Greek mistake*, and now, at dawn of the third millennium, it has come back to haunt us in the shape of the *post-modernistic* question. According to Tarnas (1991) the central prophet of the *post-modern* mind is Friedrich Nietzsche, with his radical perspectivism, his sovereign critical sensibility, and his powerful, poignantly ambivalent anticipation of the emerging nihilism in Western culture. In the 'Gay Science' Nietzsche (1887/1974) wrote:

> What were we doing when we unchained this earth from its sun? Whither is it moving now? Whither are we moving? Away from all suns? Are we not plunging continually? Backward, sideward, forward, in all directions? Is there still any up or down? Are we not straying as through an infinite nothing? Do we not feel the breath of empty space? Has it not become colder? Is not night continually closing in on us? (p. 181)

The agonizing character of uncertainty predisposes the post-modern mind to the infectious disease of absolutism and its multifarious mutating strains of pseudo-

certainty. The paradigmatic reprise confronting the understanding of ourselves and reality, poses the following question: Are we going to repeat *the brilliant Greek mistake*? Are we going to replace the current post-modernistic paralysis with some new species of absolutism? Or: do we once again converse with Socrates, or conversely, allow Socrates to converse with us? Will the disciples of the future be able to say – 'I know that I don't know', and know what they mean? Will we be able to replace the earth with the sun at the centre of the galaxy without unchaining the earth from the sun?

At the end of his life, Carl Jung wrote the following (cited in Tarnas, 1991):

> A mood of universal destruction and renewal … has set its mark on our age. This mood makes itself felt everywhere, politically, socially, and philosophically. We are living in what the Greeks called the kairos – the right moment – for a 'metamorphosis of the gods', of the fundamental principles and symbols. (p. 412)

This study posits that if modern man clings to the premise of locality, he will animate the 'metamorphosis of the gods' with the violent breath of the *will to power*, he will religiously, without repose, continue to try and dominate and destroy his own mirror image. He will not turn the other cheek.

In the 'Apology', after being sentenced to death for impiety, E – Socrates[8] (Plato, trans. 2003b) addressed the jurors and enunciated the following:

> Gentlemen of the jury – for you deserve to be so called – I have had a remarkable experience. In the past the prophetic voice to which I have become accustomed has always been my constant companion, opposing me in even quite trivial things if I was going to take the wrong course. Now something has happened to me, as you can see, which might be thought and is commonly considered to be a supreme calamity; yet neither when I left home this morning, nor when I was taking my place here in court, nor at any point in any part of my speech, did the divine sign oppose me. In other discussions it

[8] *Apology* is considered to be one of Plato's early dialogues, hence Early-Socrates. See Vlastos (1991).

> has often checked me in the middle of a sentence; but this time it has never opposed me in any part of this business in anything that I have said or done. What do you suppose to be the explanation? I will tell you. I suspect that this thing that has happened to me is a blessing, and we are quite mistaken in supposing death to be evil. I have good grounds for thinking this, because my accustomed sign could not have failed to oppose me if what I was doing had not been sure to bring some good result. (p. 68-69).

Socrates implores us to listen to our little voice, to seek the symmetrical [I], to open up Schrodinger's box in the experiment of life and not be perplexed or ashamed if we find a person inside the box knowing and not knowing at the same time, nor to reject or ignore the results if the box of the body reveals a 'self and other'. From *power to will*.

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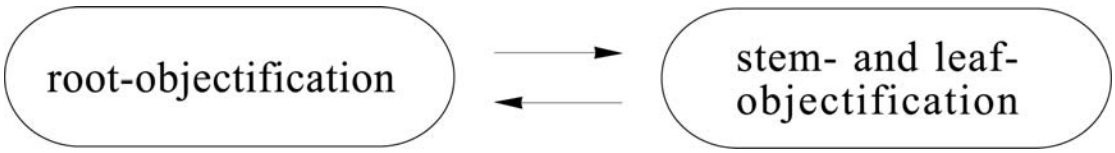
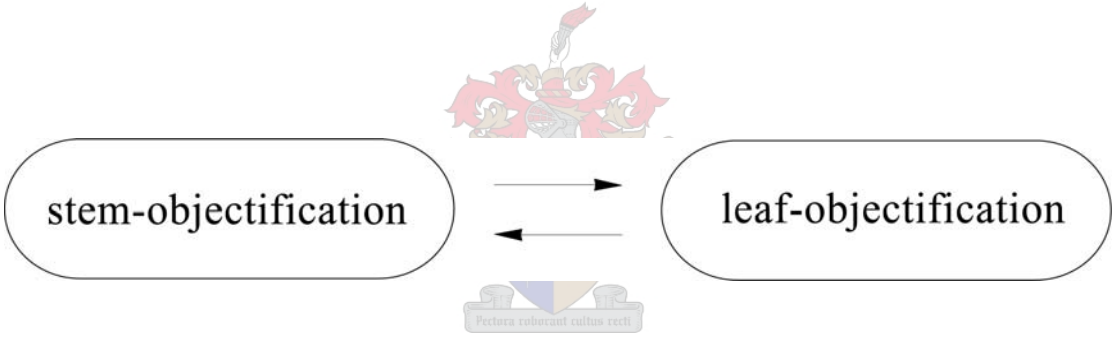
Appendix A

A) Primary field of objectification experience



B) Secondary field of objectification experience



Appendix B

Concerning reflection/parity invariance, the sketch below is taken from the book – 'Fearful symmetry' (Zee, 1986, p. 32) – the author (of this thesis) wishes to demonstrate a possible argumentation error made by physicists concerning parity invariance. To understand the sketch, the reader must be familiar with the procedure for defining the direction of spin for any spinning object. The left hand must be curled around a given spinning object so that the fingers are pointing along the direction in which the surface of the spinning object is revolving. The direction of spin is defined according to the direction the thumb is pointing. Thus the spin direction is described as either 'up' or 'down'. Now apply this procedure to the sketch (Fig. 3):

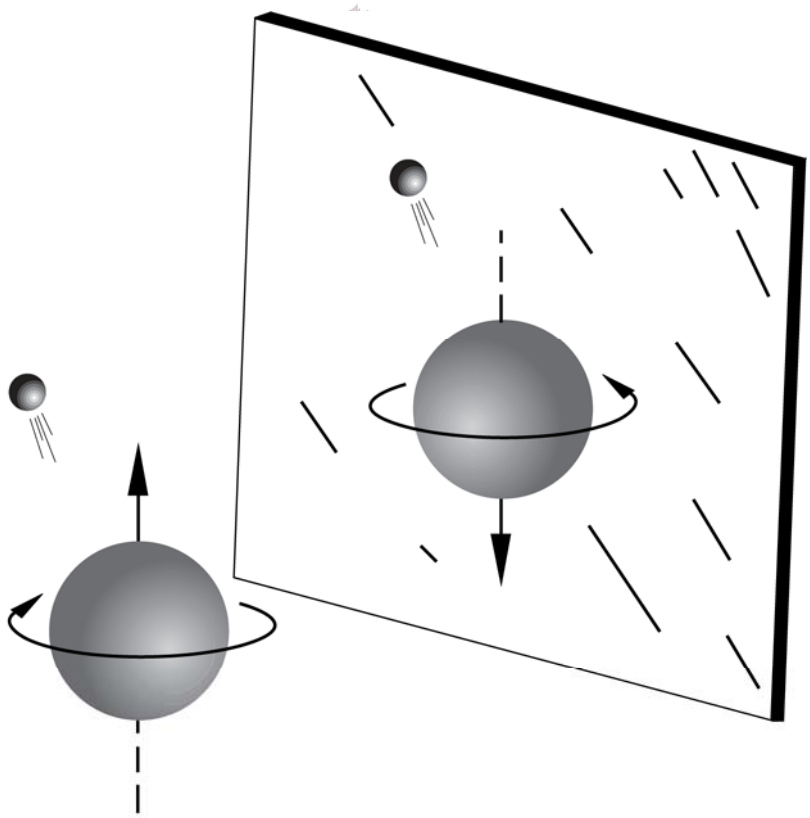


Figure 3. Spinning nucleus

The following is a direct quotation of the text that accompanied the original sketch:

> A spinning nucleus (represented as a large ball) ejects an electron (the small ball). In our world the electron emerges more or less in the direction of the nuclear spin; in the mirror world it emerges in a direction opposite to that of the nuclear spin. In the actual experiment the direction of the ejected electron relative to the nuclear-spin direction was tabulated statistically for a large number of nuclei. If the electron emerges preferentially in the nuclear-spin direction (as suggested by the figure), then we can conclude that nature violates parity invariance because a physicist in the mirror world would see the electron emerging preferentially in a direction opposite to the nuclear-spin direction. Our world and the mirror world would then be governed by different physical laws. (p. 32)

The above process supposedly indicates an apparent parity violation due to the sketch demonstrating that in the mirror world the electron emerges in the direction opposite to the nuclear spin. The possible logical error is due to the left hand being used to determine the direction of spin for the nucleus. In the mirror world the left-hand rule becomes the right-hand rule! Thus if the right-hand is now used to determine the direction of spin for the nucleus, the electron does not emerge in the direction opposite to the nuclear spin, and consequently reflection/parity invariance is not violated.

Epitaph

In loving memory of our beloved locality.

May it rest in non-locality.

399 B. C – 2004 A. D